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Editor's Note

It's What We Do

"*Why did you write about [fill in the blank]?*" That is a recurring question we get at the SKEPTICAL INQUIRER. It always puzzles me. We are a magazine for science and reason. That is our subtitle. We publish articles on all manner of topics that generally fit into that broad rubric. If there is strong public interest or some intellectual meat (preferably both) in a topic related to science and reason—usually involving a gap between the scientific evidence about a topic and the public perception of it—and we think we have something important to add, we'll write about it. The question most often comes when we take on a new subject not encountered in our pages before (three recent examples: AIDS denialism, animal-rights extremism, and climate change and its opponents). The question has arisen frequently as we expanded over the decades to cover areas not typically considered paranormal, fringe-science, or pseudoscience.

But I guess I should also have expected it when we returned in a recent issue to one of the prototypical core targets of classic scientific skepticism: the new wave of interest in UFOs. No one cares anymore about UFOs or aliens, some said. How could we write about such a trivial subject when the world's economies are collapsing and this crisis cries out for critical examination (to see one letter in this issue). Well, first, our issue was planned before the real economic plunge occurred. Second, yes, more skepticism would have definitely helped the world see the dangers in the financial bubble. We'll welcome cogent articles on that topic if they have something important to add to the millions of words we've heard already. Third, no single SI issue can convey the breadth of our interests. Over the years we have investigated many hundreds (maybe thousands) of specific topics. We'll continue to do so.

But if you don't think the world is awash with nonsense about UFOs and aliens, you aren't paying attention to the blogs and Web sites of the UFO subculture. In recent weeks (especially since we posted some of its contents on our Web site), they have been pilloring the authors of our special issue. (Personal, ad hominem attacks, not substantive responses, seem the norm in this arena.) It is clear we touched a nerve—simply by bringing informed skepticism to an area generally left to the proponents and believers.

That's what we do. No matter the topic. And we cover the entire spectrum of seriousness, from the philosophically and pragmatically consequent to "lesser" subjects that scientists and academics typically ignore but that fascinate the general public, who would otherwise be left with only sensationalized and unexamined stories and claims.

* * *

One of the topics that cries out for more critical examination is nutritional advice. In our cover article, medical professor Reynold Spector presents a thorough yet readable examination of science and pseudoscience in nutrition research and practice. His main target is well-intended but inadequate scientific studies that use inappropriate methods and thereby frequently yield wrong or misleading answers. Read his article and you will see that such flawed studies—many of which are published in reputable scientific journals and gain wide media attention—are far more common than you might think.

—KENDRICK FRAZIER

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Autism-Vaccine Link Researcher Andrew Wakefield Accused of Faking His Data

STEVEN NOVELLA

Andrew Wakefield, the researcher who in 1998 sparked the public controversy over whether the MMR (mumps measles and rubella) vaccine is linked to autism, may have faked his data. Wakefield and others published a small study of only twelve subjects in *The Lancet* claiming it was evidence for a link between the MMR vaccine and autism (Wakefield 1998). As a result, compliance with the MMR dropped from 92 percent in the U.K. down to 85 percent, and measles cases soared from only fifty-eight cases in 1998 to 1,348 cases in 2008. Fears have also spread to the U.S., where measles cases are also starting to increase.

Wakefield's paper has already been thoroughly discredited, and subsequent studies have shown convincingly that there is a lack of association between MMR or vaccines in general and autism. For example, one of the key components of Wakefield's theory is that autism is linked to gastrointestinal disorders in some children, potentially allowing the measles virus from the vaccine to enter the bloodstream and wreak havoc. A replication of Wakefield's experiment by Mady Hornig was published last September in *PLoS ONE* (Hornig 2008). Hornig found no correlation between MMR and autism and also did not find the measles virus in the guts of children with autism and GI complaints, directly contradicting Wakefield.

Far larger than the scientific controversy stirred up by Wakefield, which has largely been settled, is the storm of ethical concerns regarding his scientific behavior. In 2004, ten of Wakefield's co-authors withdrew their names from the original publication, and *The Lancet*'s editors published a retraction, citing undisclosed conflicts of interest by Wakefield (*Lancet* 2004). Specifically, Wakefield did not disclose a large consulting fee he received from attorneys representing clients suing over claims that their children's autism was caused by MMR. In fact, eleven of the twelve children in Wakefield's study were part of the litigation. Further, nine months prior to publishing the study, Wakefield applied for a patent for a new

Dr. Andrew Wakefield attending the G.M.C. in London, which is investigating him for ethics violations.

MMR vaccine that he claimed was safer. He therefore stood to make phenomenal profits from scares over the current vaccine's safety (Deer 2008).

Investigative journalist Brian Deer has been putting the pieces of the Wakefield puzzle together for several years now. His investigations recently uncovered evidence that Wakefield may also have faked his original data. He writes: "Our investigation, confirmed by evidence presented to the General Medical Council (GMC), reveals that: In most of the twelve cases, the children's ailments as described in *The Lancet* were different from their hospital and GP records. Although the research paper claimed that problems came on within days of the jab, in only one case did medical records suggest this was true, and in many of the cases medical concerns had been raised before the children were vaccinated. Hospital pathologists, looking for inflammatory bowel disease, reported in the majority of cases that the gut was normal. This was then reviewed and *The Lancet* paper showed them as abnormal" (Deer 2009).

Andrew Wakefield remains under investigation by the U.K.'s General Medical Council for ethics violations. He remains unrepentant about his claims and has since moved to America, where he runs the Thoughtful House autism center in Austin, Texas.

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Steven Novella, MD, is a clinical neurologist and president and co-founder of the New England Skeptical Society.

More Studies Reject Vaccine-Autism Link

As if more scientific support was needed, a new review of the evidence has again shown no link between vaccines and autism. And a new study from Italy bolsters the case even further.

Concerns by some parents have kept alive the idea of some link, which has not been supported by the scientific literature (see "The Anti-Vaccination Movement," SI November/December 2007).

Jeffrey S. Gerber and Paul A. Offit of the Division of Infectious Diseases at Children's Hospital of Philadelphia published a review in the February 15 (2009) *Clinical Infectious Diseases* (48:456–61) of twenty peer-reviewed scientific studies published between 1999 and 2004. The studies show no connection.

The authors examined three specific claims some have proposed: the combination measles-mumps-rubella vaccine causes autism by damaging the intestinal lining; the mercury-containing preservative thimerosal, formerly in some vaccines, is toxic to the central nervous system; and the simultaneous administration of multiple vaccines overwhelms or weakens the nervous system.

They reviewed the relevant epidemiological evidence and found no support for these claims. In one study, for instance, researchers in England evaluated 498 autistic children born from 1979 through 1992. No change in the rates of autism diagnoses after the 1987 introduction of the MMR vaccine was observed. A study in Denmark compared the incidence of autism in children who had received two different levels of thimerosal or no thimerosal at all. There was no relationship between thimerosal exposure and autism. On the third claim, they note that vaccines "do not overwhelm the immune system . . . even conservative estimates predict the capacity to respond to thousands of vaccines simultaneously."

"Twenty epidemiologic studies have shown that neither thimerosal nor MMR vaccine causes autism," conclude Gerber and Offit. "These studies have been performed in several countries by many different investigators who have employed a multitude of epidemiologic and statistical methods. The large size of the studied populations has afforded a level of statistical power sufficient to detect even rare associations.

"These studies, in concert with the biological implausibility that vaccines overwhelm a child's immune system, have effectively dismissed the notion that vaccines cause autism. Further studies on the cause or causes of autism should focus on more-promising leads."

The new Italian peer-reviewed study was carried out over a ten-year period and published in the February issue of *Pediatrics.* Thousands of healthy Italian babies in the early 1990s were given two different amounts of thimerosal as part of their routine vaccinations. Ten years later, 1,403 of those children were identified and given a battery of brain-function tests. Researchers found small differences in only two of twenty-four measurements, and "they might be attributable to chance," they said. Only one case of autism was found, and that was in the group with the lower thimerosal.

"Put together with the evidence of all the other studies," said the study's lead author, Alberto Tozzi of Bambino Gesu Hospital in Rome, "this tells us there is no reason to worry about the effect of thimerosal in vaccines."

—Kendrick Frazier

Scientists Hail Gallo's 'Unsung' Role in Nobel HIV/AIDS Discovery

When the 2008 Nobel Prize in Medicine was awarded to two French virologists for discovering and identifying the HIV virus, a number of scientists questioned why American scientist Robert Gallo wasn't also named. He is generally credited as a co-discover of the HIV virus and the person most responsible for proving it causes AIDS.

The Nobel foundation obliquely acknowledged that situation by saying the prize went for the *discovery* of the virus, not for detection of the link between the virus and the AIDS disease (SI News and Comment, January/February 2009).

Biomedical scientists (106 in all) from seventeen countries have published a letter in a prominent scientific journal saying Gallo deserves equal credit. And a major event is planned in May honoring Gallo on the twenty-fifth anniversary of his co-discovery.

© Riccardo De Luca

U.S. biomedical researcher Robert C. Gallo gives a press conference on World AIDS Day in Rome.

In a letter titled "Unsung Hero Robert C. Gallo" (*Science*, 323: 206, 2009), the international group of scientists say that while Nobel Prize recipients Françoise Barré-Sinoussi and Luc Montagnier "fully deserve the award, it is equally important to recognize" Gallo's contributions.

"Gallo definitely proved HIV-1 as the cause of AIDS through the successful isolation and long-term cultivation of HIV-1 and developed a diagnostic kit that prevented new infections and saved thousands of lives. These contributions

. . . warrant equal recognition. . . ."

The letter continues: "Barré-Sinoussi and Montagnier isolated a virus but . . . could not establish whether it was the AIDS virus, an achievement accomplished by Gallo and colleagues just one year later. Gallo . . . learned to grow the virus and, furthermore, discovered its role, saved the blood supply, and opened the way for drug and vaccine development. Without Gallo's contributions, the relevance of the virus to AIDS might not have been recognized and many thousands more lives would have been lost. Given the enormous impact of these developments on the lives of countless thousands globally, Gallo's contributions should not go unrecognized."

Gallo also has been outspoken against those who try to deny that HIV is the cause of AIDS ("AIDS: Denialism vs. Science," September/October 2007).

An endnote to the *Science* letter says the letter-writing initiative was done independently of Gallo's influence. The coordinator of the letter effort is Guido Poli, head of the AIDS Immunopathogenesis Unit at San Raffaele Scientific Institute in Milan, Italy.

Poli says he and the letter writers, many of them leaders in the HIV field, felt the Nobel committee had an unfortunate anti-Gallo bias. Poli worked at the National Institutes of Health for seven years and witnessed the development of AIDS research during its first years.

He told the SKEPTICAL INQUIRER he hadn't heard from Gallo directly, "although people in his staff told me that he was happy about the letter."

May 4, 2009, marks the twenty-fifth anniversary of Gallo's paper in *Science* reporting his findings identifying the AIDS virus. To commemorate the discovery, the University of Maryland School of Medicine is hosting a three-day celebratory event in Baltimore May 9–11. It includes a gala honoring Gallo, "Celebrating a Visionary's Quest for Discovery," and a symposium, "25 Years After Discovering HIV as the Cause of AIDS." The National Cancer Institute, where Gallo did his research, is co-sponsor.

Poli told SI he has been invited as a speaker to the celebration. "I interpret that as a way to say 'thanks!'"

—*Kendrick Frazier*

Selective Memory at Work When Patients 'Predict' Own Death

Can medical patients predict their own deaths using some fancy type of "insight" that is more accurate than the medical tests and expertise of physicians? The answer is yes, according to an article by Dr. Sandeep Jauhar, a Long Island, New York, cardiologist. The article "The Instincts to Trust Are Usually the Patient's" appeared in the January 6, 2009, *New York Times* Science Times section (D6). Jauhar describes just two instances in his practice where patients who were not expected to die said that they expected to die and, some time later, did exactly that, thus suggesting to Jauhar that patients "have a sixth sense about their own deaths." In the first case, an "elderly" gentleman with congestive heart failure was admitted to the hospital. At one point he said, "I am going to die here." Initially, his case was "relatively mild. But then he became sicker." He died several days later. The second case was that of a woman who "told us calmly on morning rounds that she had a feeling she was going to die that day." Later that day she did die.

Neither of these cases seems particularly surprising. Both patients were already in the hospital and not for trivial reasons. Both must have been anxious. Undoubtedly many patients in such situations express anxiety and fear of death, even when they are not expected to die. When, as expected, they do not die, it's no big deal and isn't remembered. But when such a patient does die, it's a notable event and is remembered.

This type of selective memory is an important cause of belief in many nonexistent phenomena. Another from the medical arena is the belief that more babies are born when the moon is full. This is simply false. There have never been any well-done studies that support such a belief. So from whence did the belief spring? Selective memory on the part of maternity-room personnel. When there happens to be a lot of births during a full moon, it is noted and remembered. Neither slow nights when the moon was full nor busy nights when it wasn't are taken into account as evidence against the relationship. Selective memory also plays an important role in the belief in such things as astrology, biorhythm theory, prophetic dreams, and the like.

But memory is not only selective, it is constructive. The physician who believes in the prophetic abilities of patients to foretell their own deaths will be very likely to misremember patients' comments as more prophetic than they actually were. Any claim that is based only on such selective memories should be viewed with great suspicion.

—*Terence Hines*

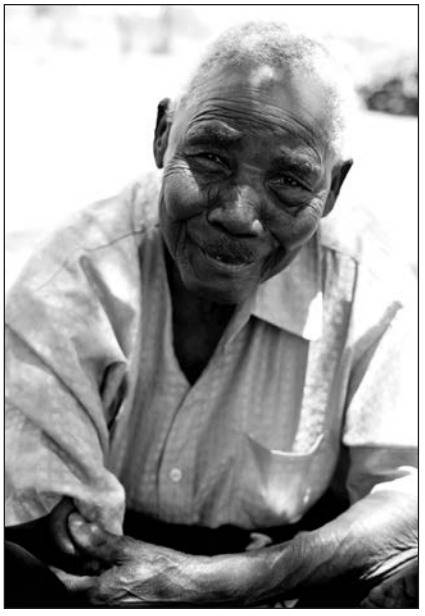
Terence Hines is a professor of psychology at Pace University, Pleasantville, New York, and author of Pseudoscience and the Paranormal *(Prometheus 2003). E-mail address: TerenceHines@aol.com.*

A Modern Witch Craze in Papua New Guinea

Newspapers internationally reported a recent spate of witchcraft-related murders in rural Papua New Guinea. The media interest began with a case in which a young woman was stripped naked, bound and gagged, tied to a log, and set on fire by a band of villagers. She burned to death in the blaze. Local authorities believe she was suspected of being a witch. Within days, a man was accused of using magic to kill another

villager. Pronounced guilty by an ad hoc court, the man was slashed to death with bush knives by an angry mob.

Belief in witchcraft is rampant in rural Papua New Guinea, and murder for suspected sorcery is a common practice. In 2008, some fifty people were victims of witchcraft-related murder in the Highlands provinces. While there are no exact figures, many incidents occur in remote areas and remain unreported. When a death occurs, the locals often close ranks and refuse to cooperate with the authorities.



Accused of being a witch by the local community after all of her children and her husband died, this Tanzanian woman was attacked by a man with a machete who chopped off her arm.

This modern witch craze is worldwide. As Leo Igwe of the Center for Inquiry/Nigeria has noted, ritual killings and witchcraft-related murders are prevalent in many parts of Africa. These crimes are also widespread in South America and Asia, especially in India and Malaysia. There are scattered cases in Europe, especially in the United Kingdom, and even in Australia.

The practice also exists in America. Last year there were two reports of witchcraft-related murder trials in the United States—the cases of Carla Mendez in Los Angeles and Lawrence Douglas Harris Sr. in Sioux City, Iowa. Voodoo, santeria, animal sacrifice, and other forms of "black magic" are still practiced in some parts of the country, particularly in communities in Miami and New Orleans.

Belief in sorcery is strongly rooted in Papua New Guinea. Many believe in the existence of *sangumas*, witches, sorcerers, or people with magical powers. *Sangumas* are accused of invoking curses, hexes, and spells to bring misfortune to their villages. These victims are held responsible for occurrences where natural explanations can be offered but aren't recognized. *Sangumas* are often blamed for natural disasters and seemingly inexplicable deaths, for example, from cancer or HIV/AIDS.

The legal proceedings that follow the accusation are a sham. The victims are usually tried by church pastors and unqualified officials presiding over a kangaroo court. The inevitable punishment is execution, performed immediately in a public place by a frenzied group of tribespeople. Victims are sometimes hanged, stoned, shot, beheaded, butchered, buried alive, or burned at the stake after being doused with gasoline and set on fire. Others escape death but suffer attempted murder, sexual abuse, and torture, often to extract a confession.

Disturbingly, accusations of witchcraft are not invariably indicative of superstitious belief. Sometimes there are ulterior motives underlying the claims. Some deaths are crimes of vengeance or of an accuser seeking resolution in an ownership dispute. Some murders are drug-related. In a real-life version of Arthur Miller's *The Crucible*, some victims have violated social taboos and are guilty of socially stigmatized behavior, such as infidelity, unmarried pregnancy, or homosexuality. To shift blame and avoid punishment for real crimes, charges are often laid against innocent individuals or even animals. In Kwara, Nigeria, a goat was held in custody for attempting to steal a vehicle. A literal scapegoat, it is claimed that the human culprit transformed magically into a goat to escape arrest.

Papua New Guinea is in dire need of skepticism, education, and legal reform. It appears that the latter is finally happening. These latest horrific killings, and no doubt the ensuing media outrage, have prompted the country's Constitutional Review and Law Reform Commission to create new laws to prevent (or at least reduce) witchcraft-related deaths.

—Karen Stollznow

Karen Stollznow, PhD in linguistics from the University of New England, is editor of The Skeptic *magazine (Australia), a director of the Bay Area Skeptics, and a committee member of CFI/San Francisco.*

Remembering Henry Gordon, Magician, Skeptic, Debunker

Kemo Kimo Merinickel Pumpernickel. Henry Gordon invented this phrase to use as an incantation in his magic, just as he created or taught himself everything he needed in life. They were spoken again by his granddaughter Sandra at his funeral in January. Gordon—magician, skeptic, columnist, broadcaster, entrepreneur, co-founder of the Ontario Skeptics, and fellow of the Committee for Skeptical Inquiry—died January 24, 2009, at the age of eighty-nine.

In 1940 Montreal, Henry was a young man interested in radio repair and Morse code. Zita, Henry's then-girlfriend and later beautiful assistant in his magic shows, remembers walking down St. Catherine Street. The Royal Canadian Air Force was advertising its need for radio operators. Henry quickly enlisted and was sent to help start an air training camp in western Canada.

"As a relaxation, away from his daily demands, he became interested in the

fine art of magic," says Zita. "That's where the love of this art and the psychology of it and what it can do for an individual began." A year later he and Zita were married. A terrific writer, he proposed through the mail.

Henry was honorably discharged from the service in December 1941. With his knowledge of electronics and his entrepreneurial spirit, he built the first recording studio open to the public in Montreal.

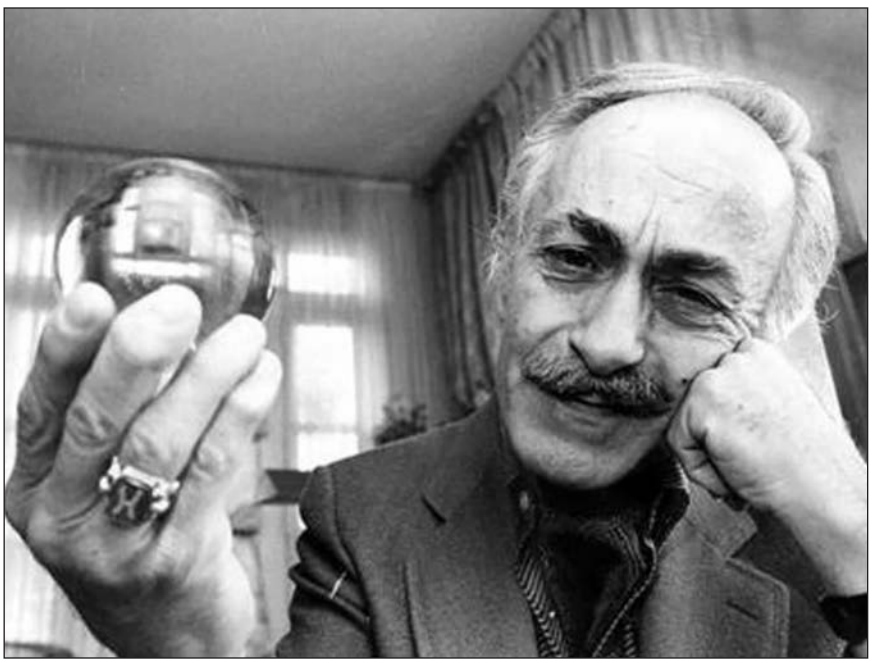
In the exciting atmosphere of the 1960s, it seemed appropriate to experiment by opening the first party supply store in the city. "Henry Gordon's Party Centre" opened to great fanfare, selling "everything for enjoyment under one roof," as its motto proudly declared. It was a great success. "Henry always said, if you want to try something you've got to find the timing and go along with the bumps," explains Zita.

He opened a school for magic in the store, which thrived for nineteen years. Having always referred to magic as a fine art and to himself as an honest fraud, he became very annoyed by the famous magicians who cashed in on the psychedelic period by calling themselves psychics and destroying the integrity of magic.

One of the earliest debunkers, in the 1970s he (with Zita) performed magic and debunking on cruise ships. "It proved to be very successful, particularly when sailing through the Bermuda Triangle," Henry joked in his article in the book *Skeptical Odysseys,* edited by Paul Kurtz. In 1978, Kurtz attended a skeptical symposium in Montreal, and shortly afterward Henry was elected a scientific and technical consultant to CSICOP.

For two years Henry wrote the debunking column "ExtraSensory Deception" for the *Toronto Sun*, which was the first such column in North America. He went on to write a regular column called "Debunking" for the *Toronto Star*'s Sunday paper.

Editor Gerry Hall, who wanted to introduce facts and science to counter the generally pro-paranormal tone of many newspapers, was attracted to Henry's work because of his diligence and care for detail. "He was a skeptic who was willing to do the work to track something down," says Hall. "There were a coterie of people who made yearly predictions and he would have probably had a complete file on them and he would find the twenty things they predicted that were wrong." Henry turned his critical eye to everything from UFO sightings to psychic detectives and chiropractors.



Henry Gordon was a fellow of the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), now CSI. He was well-known internationally for his exposures of Uri Geller, Shirley MacLaine, and other paranormal practitioners in his books, articles, and television appearances.

His writing and skepticism fed on each other. By now a CSICOP Fellow, he would often report on its activities. Meanwhile, his writings attracted a great many people—especially students—into the movement. Two physics students helped him start the Ontario Skeptics, along with Eric McMillan.

"When I first met him he was writing a column in the *Star* about debunking," McMillan recalls. "That was mind opening for me, for me that was what turned me on to skepticism."

There was a great deal of excitement at the launch of the organization. "It was often said, we light our little candle in the dark and hope to attract people to that light, but still we realize we're just one little light in the dark."

There were instances when that light seemed quite a bit brighter. In 1987 Henry Gordon appeared on WBZ-TV Boston along with Uri Geller. Geller attempted to perform his well-known trick of moving a compass needle by waving his hands. After much grunting, Geller had to give up. Henry had strapped a much stronger magnet to his knee.

Another high point occurred when Henry appeared at Montreal's popular Saidye Bronfman Theatre disguised as psychic Elchonen. He fooled the audience and then later returned on stage as himself. Some asked to have their money refunded, but many returned to hear Henry speak on the paranormal.

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– Jacob Bronowski, scientific polymath

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Toni Van Pelt, Paul Kurtz, and Ron Lindsay (standing); Lawrence Krauss, David Helfland, and Nobel Laureate Paul Boyer (seated) introduced the Declaration in Defense of Science and Secularism at the inaugural press conference of the Center for Inquiry/Office of Public Policy in Washington, D.C.

Local leaders, campus activists, and students from around the world came together at CFI's Summer Session.

Latin American and U.S. skeptical activists met at the CFI-sponsored First Iberoamerican Conference on Critical Thinking in Peru.

The new Naturalism Research Project will more than double our library facilities and create a collegial setting for scholarly dialogue and research.

These incidents, as well as many of his columns, are described in his book *Extrasensory Deception* (Prometheus Books 1987). Henry authored magic books for children as well as one focusing almost exclusively on Shirley MacLaine, titled *Channeling into the New Age.*

A gifted performer before audiences of hundreds, Henry was equally comfortable entertaining small groups. He was a real family man. At his funeral ceremony his granddaughter affectionately referred to him as Zaida, noting that his magic took place both on and off stage. The spotlight didn't shine on every magical moment Henry gave his family and the world, she added, but at that moment the spotlight was shining on Henry one more time.

Henry was indeed involved in one last bit of magic. A broken wand ceremony was carried out by Ron Guttman, past president of the Sid Lorraine Hat and Rabbit Club, the Toronto branch of the International Brotherhood of Magicians (IBM). The broken wand symbolizes broken hearts at Henry's absence. It also represents the fact that a wand without its magician is of no use. "We send Henry into the mystery of all mysteries," said Guttman, concluding the ceremony.

The Club had awarded Henry an Order of Merlin, which recognizes a member's service of over twenty-five years to IBM. Skepticism was a vital part of Henry's magic, and in turn, magic informed his skeptical enterprise.

Throughout his life, Henry was a major figure in city life wherever he lived, and he appeared regularly in the media, from *Larry King Live* to opera. Once on CBC's *Radio Noon* he was introduced: "We're going to talk about ghosts today, and here is Henry Gordon who has come to spoil our day again." A skeptic is not usually rewarded, but Henry was a hero, and, according to Gerry Hall, he made a difference. "He was one of the great skeptics in Toronto and we are lucky we got him."

To McMillan, Henry demonstrated that "a skeptical life is not necessarily a life with a narrow focus, that we just focus on paranormal nonsense and science to correct it. A skeptical life is being interested in everything . . . everything that has to do with human beings."

"He had an intellectual curiosity, whether it was mechanics, whether it was music . . . [he was] self taught. . . . My goodness, he was full of surprises," said Zita.

—Justin Trottier

Justin Trottier is executive director of the Center for Inquiry/Ontario.

Report Knocks Baylor Claim about American Religiosity

Do nonreligious people in America represent a larger group than has been portrayed?

The Council for Secular Humanism (a sister organization to our Committee for Skeptical Inquiry) made some headlines in February with a report released to the national media calling into question many of the findings contained in a widely cited Baylor University Religion Survey of 2008. Baylor, a Baptist university, claimed in its survey that America is as religious as it has always been, adding that belief in religion is a universal characteristic displayed by all peoples around the world. Baylor researchers recently published their findings in a book called *What Americans Really Believe* (Baylor University Press, 2008).

The CSH report, "Is the Baylor Religion Study Reliable?" (www.secularhumanism.org/greg-paul-baylor.pdf), contradicts these claims, suggesting that Baylor and lead researcher Rodney Stark may have improperly evaluated the data and consequently misinformed the public and the media.

The Council's report points to a growing body of research by academic institutions and major survey organizations that clearly documents a downward

For the Record:

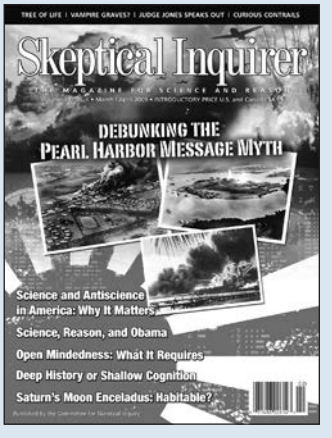
The USS *Missouri* was not commissioned until June 1944 and thus was not one of the ships damaged in the Japanese attack on Pearl Harbor December 7, 1941 (caption error, page 29, May/June 2009). Our 2008 photo showed the USS *Missouri* Memorial at Pearl Harbor, where since 1999 the *Missouri* has been a museum ship. On September 2, 1945, in Tokyo Bay, the *Missouri* hosted the signing of Japan's official unconditional surrender, ending World War II.

* * *

Amos Tversky died in 1996, not 2006, as written in a New Books listing of Stanovich's *What Intelligence Tests Miss* (March/April 2009, page 56). Tversky thus missed out sharing the 2002 Nobel Prize in Economics with his longtime collaborator, cognitive scientist Daniel Kahneman. The error was ours.

* * *

John F. Kennedy was assassinated on November 22, 1963, not October 22 ("What Do Skeptics Need to Explain?" March/April 2009, page 58).


Skeptical Inquirer
DEBUNKING THE PEARL HARBOR MESSAGE MYTH
Science and Antiscience in America: Why It Matters
Science, Reason, and Obama
Open Mindedness: What It Requires
Deep History or Shallow Cognition
Saturn's Moon Enceladus: Habitable?

shift of religious adherence in the United States. Why does the Baylor study contradict this? Independent scholar Gregory S. Paul, author of the Council's report and author of a major article on these matters in *Free Inquiry* (December 2008/January 2009) says that Baylor relied on a flawed methodology.

"The Baylor team has adopted a curious way of treating atheism, forms of unbelief short of atheism, and religious belief. This approach places a disproportionate emphasis on convinced atheism—the confident rejection that a personal God exists—at the expense of more moderate forms of nontheism," said Paul. The report suggests that Baylor has failed to document large numbers of Americans who reject conventional religious beliefs, such as those who self-define as agnostic or "spiritual but not religious." The Council's report declares that "Baylor's methods largely ignore these doubters, making nonbelief appear less prevalent in society than it truly is. The Baylor team treats almost any deviation from strict atheism as a sign of religiosity. Doing so falsely maximizes the apparent level of faith."

The United States is still the most religious country in the First World, but the Baylor thesis that "'faith American style' is holding its own is clearly false," states the report. "Religious belief and activity in America are trending downward in so many ways that it is simply untenable to pretend that the nation is growing more religious."

Spanish Skeptics Magazine *Pensar* Suspends Publication

Pensar, the Spanish-language skeptics magazine launched in 2004, has suspended publication as of 2009. The magazine covered many topics, including global warming, AIDS denial, miracles, and ghosts, as well as lesser-known regional topics specific to Latin America.

According to Editor Alejandro Borgo, though *Pensar* was well-received during its five-year run, the magazine was unable to achieve the subscription and distribution levels needed to maintain publication. The rising cost

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PENSAR
Revista Latinoamericana para la ciencia y la razón
La rebelión del mono
Conozca las falsas predicciones de los gurúes de la economía
Líneas de Nazca
Aterrizando en los laberintos del desierto
Pinturas rupestres
¿OVNIS en el arte prehistórico?
El código Da Vinci
Literatura, historia y conspiraciones
El detector de Dios
Fraude metapsíquico
Telebasura: breve visita al Castillo paranormal
Peces en Marte

of paper, printing, and postage—combined with the global economic recession—finally made *Pensar* too costly to maintain in its current form. The *Pensar* editorial staff and writers expressed their appreciation to readers for their support and are looking for ways to keep some of the material in circulation.

CFI/Los Angeles Celebrates Darwin's 200th Birthday with Readings, Plays, Lecture

More than 300 Southern Californians celebrated the 200th birthday of Charles Darwin by crossing the threshold at the Center for Inquiry/Los Angeles and attending three special events, crammed into just a few days, enthusiastically presented by CFI staff, volunteers, and participants.

Before the gatherings at the Steve Allen Theater, CFI/Los Angeles announced *Darwin Aloud*, an international project collecting video from around the world of people reading from *On the Origin of Species*, Darwin's groundbreaking book outlining evolution by natural selection. This planet-wide gesture honoring the father of evolution will be edited into a short film this spring in Hollywood. See

Actors Charles Shaughnessy and Gary Cole as Charles Darwin and Steve Allen, respectively, riveted the audience in the hour-long reading that pitted historical actors from different eras engaging in discussions about their lives and ideas. The episode and others were originally written by Steve Allen and performed on PBS in the 1970s.

www.cfiwest.org/darwinaloud for more details.

On Darwin's birthday (February 12), more than 100 people crowded into a theater-in-the-round for a staged reading from an episode of *Meeting of Minds*, Steve Allen's PBS series that brought together famous historical figures. The reading was the companion piece to the episode staged last year involving the same characters.

Five noted television and movie actors played Darwin, Galileo, Emily Dickinson, and Attila the Hun discussing and debating their ideas with moderator Steve Allen. Reprising their characters from last year were Oscar nominee Robert Forster (*Jackie Brown*) as Galileo; Dan Lauria (*The Wonder Years*) as Attila, and Wendie Malick (*Just Shoot Me*) as Emily. Portraying Darwin this year was Charles Shaughnessy (*The Nanny*), and bringing Steve Allen to life was Gary Cole (*The West Wing*). Directing the episode again was Frank Megna, and it was again co-produced by Diana Ljungaeus and Bob Ladendorf.

Steve Allen's son Bill attended the performance. Jayne Meadows, Allen's widow, could not be present but sent a warm note (read by Cole as Steve) praising last year's production and wishing us the best for this year's performance. The reading was followed by a champagne toast led by CFI/Los Angeles Executive Director Jim Underdown and a Darwin birthday cake.

The following Sunday morning, author David Contosta spoke to more than 100 attendees at CFI/Los Angeles and in Orange County about his new book on Darwin and Lincoln (born on the same day as Darwin in 1809). *Rebel Giants: The Revolutionary Lives of Abraham Lincoln and Charles Darwin* (Prometheus Books) was nominated for the Lincoln Prize for the best book about Abraham Lincoln in 2008.

Rounding out the week's events on Sunday afternoon was a performance of *A Dangerous Descent*, playwright/biochemist Colin Cox's Garden-of-Eden clash between Adam, Eve, and Adam's first wife Lilith (yes, *first* wife.) The three find a pocket watch and dive into a scorching argument about whether it was intelligently designed or not. Even the primarily CFI-minded audience had to hang on for dear life as the three (fictional) characters blazed through an array of arguments that spanned both centuries and many branches of learning. More than a hundred attended, including the noted actor Michael York.

It was a truly exhilarating week at CFI/Los Angeles honoring the life and ideas of the scientist whose work has withstood the test of time—and creationists.

—Jim Underdown and Bob Ladendorf

Jim Underdown is the executive director of CFI/Los Angeles and Bob Ladendorf is its chief operating officer.

QuoteWorthy

My father was very well known. Less well known was that he was responsible for the Roswell incident [when people believed they'd spotted a UFO]. He was the chief scientist [in a secret military/CIA project] and was looking for a sound channel in the atmosphere for the purpose of detecting bomb tests.

—Fred Spilhaus, retiring executive director of the American Geophysical Union, speaking of his late father, meteorology professor Athelstan F. Spilhaus, who was director of research for the secret New York University constant-level balloon experiments launched from New Mexico in June 1947 that became known as Project Mogul. Interview in Physics Today, *February 2009.*

There are many steps between detecting an Earthlike planet and reliably assessing whether it has a biosphere. Life's origin on Earth is still a mystery, so we cannot lay firm odds on its likelihood elsewhere. But we may learn, in the coming decades, whether biological evolution is unique to the pale blue dot in the cosmos that is our home, or whether Darwin's writ also runs in the wider universe.

—Martin Rees, the Astronomer Royal and professor of cosmology and astrophysics at Cambridge University, in an editorial in Science (323:309), *"Pondering Astronomy in 2009"*

Darwin's great idea has moved on. Twenty-first century evolutionary science, if Darwin could return to see it, would enthrall, excite, and amaze him. But he would recognize it as his own. We are just coloring in the details. For my money, the most important thinker the human species has ever produced was Charles Darwin.

—Richard Dawkins, "The Power of Darwin," *Free Inquiry*, February/March 2009

Life and Planet

Evolution, Climate Change Two Grand Themes of AAAS Science Fest

KENDRICK FRAZIER

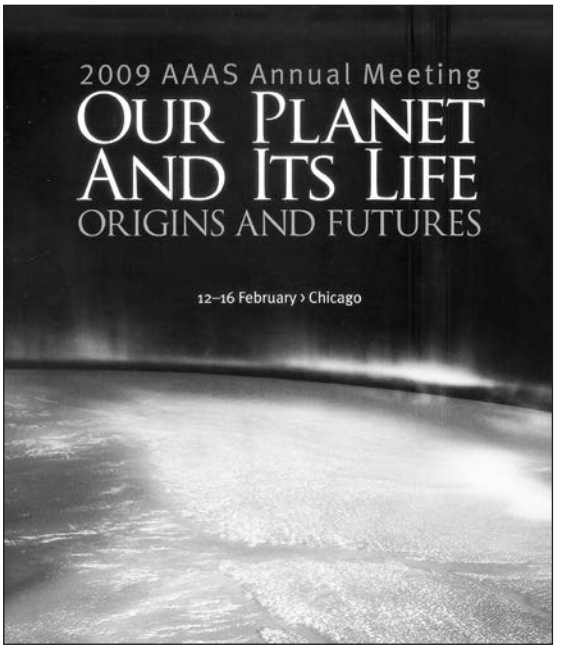
They may be the closest thing the U.S. has to an annual science festival.

The annual meetings of the American Association for the Advancement of Science are a cornucopia of symposia, public lectures, exhibitions, workshops, and social events that yearly take the pulse of the planet—and of science itself. Elder statesmen of science mingle with community college teachers. World media by the hundreds come. There's fun too: a Science Day for school kids and, this year for those just slightly older, a "Dance Your PhD Research" contest. The sessions provide some new scientific results. But unlike more specialized conferences, they also bring together scientists and scholars from widely different fields to discuss broader issues and impacts at the intersection of science and society.

This year's meeting, in Chicago, was titled "Our Planet and Its Life: Origins and Futures." I missed the previous two meetings, so I was particularly keen to make this one. A couple of years is a long time in science, and I wanted to catch up.

Two overriding themes permeated a large majority of the sessions over five days in February: the intensifying effects of global climate change and the pervasive importance of evolution to most all the sciences.

And overlying it all was a veneer of two recurring subthemes: concern over the collapsing economy and the effects it will have on world conditions and scientific progress and relief and gratitude to have a president in office who has promised "to restore science to its rightful place."



The evolution theme was of course keyed to the 200th birthday of Charles Darwin, which happened to occur on the opening day of the meeting and was celebrated in various ways throughout the five days—along with this year's 150th anniversary of the publication of Darwin's landmark book *On the Origin of Species*.

"Darwin was an astute observer," outgoing AAAS President James J. McCarthy told the assembled media in a breakfast briefing before the meeting got underway. "That's why he got things right." It is a lesson worth remembering.

"Darwin talked about what he saw and how it could happen. He didn't postulate," McCarthy emphasized. Darwin's thoroughness and rigor in his observations is why scientists were so quickly persuaded to his conclusion that evolution by natural selection has shaped all life on earth.

McCarthy lamented that "for whatever reason, there are people who don't respect what science tells us" about life, origins, and evolution. "Evolution is not an idea, it is a fact," he made clear. "It is impossible to deny evolution." Darwin saw evolution actually happening in nature, McCarthy noted, and we do too. Bacteria quickly evolving to resist current drugs is just one of the many obvious modern signs of evolution in action. "Evolution as an everyday phenomenon is really impossible to refute."

McCarthy is the Alexander Agassiz Professor of Biological Oceanography at Harvard and a leading advocate of earth system science. "We are looking at the interlinking parts of the earth system," he says, "the biochemistry of the interactions of ocean, atmosphere, and land."

He has served on national and international groups that have studied climate change. He was co-chair of the

Kendrick Frazier is editor of the SKEPTICAL INQUIRER *and a fellow of the American Association for the Advancement of Science. He is editor of* Science Under Siege, *a collection of SI articles to be published by Prometheus Books in May.*

Intergovernmental Panel on Climate Change, Working Group II, which assessed impacts and vulnerabilities for the Third IPCC Assessment in 2001, and he was lead author of the Arctic Climate Assessment.

Our modern-day, acute observations tell us something important, says McCarthy. "As recently as twenty years ago, we could see no evidence of global climate change. But the body of evidence came together in the late 1990s. We see evidence consistent with a warming world," he said. "Now we know it is changing, on a worldwide basis. Climate is changing literally as we speak.

"We have choices to make," said McCarthy. "Climate change will have a profound effect a few decades out." The changes, he warned, will be "dramatic if we don't make the right choices. . . . The choices to make are not simple ones. We need a very critical eye, and scientists need to be involved."

* * *

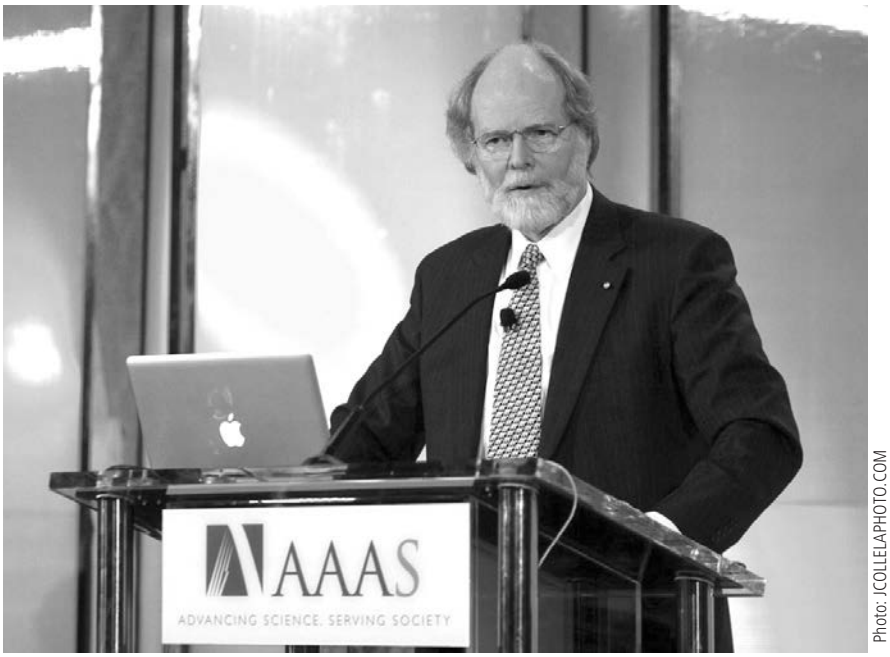


Photo: JCOLLELAPHOTO.COM

AAAS President James McCarthy

And so it began. Here are some other highlights I found of special interest for SI readers.

The first real news was the announcement of the first draft sequence of the Neandertal genome. An international consortium of scientists led by the Max Planck Institute for Evolutionary Anthropology presented a live video news conference from Leipzig, Germany. One of

Evolution Defender Kenneth Miller Wins AAAS Public Understanding of Science Award

Biologist Kenneth R. Miller, perhaps America's single most effective scientific explainer of evolution and opponent of intelligent design, received the AAAS Award for Public Understanding of Science at the Chicago 2009 AAAS meeting.

Miller, professor of biology at Brown University, was cited for "his sustained efforts and excellence in communicating evolutionary science." The AAAS committee called him "a superstar in the public outreach and engagement world."

Miller was one of the key scientific witnesses in the Dover, Pennsylvania, case that resulted in U.S. District Judge John E. Jones III ruling that intelligent design is not science and has no place in public-school science classes.

"He made an extraordinarily persuasive public case for the power of science in general," the AAAS said. "He did the scientific community an immeasurable service" by helping to uphold the integrity of science education.

Miller frequently lectures about the beauty and power of evolution, along the way dismantling in detail scientific claims made by proponents of intelligent design creationism.

He is author, most recently, of *Only a Theory: Evolution and the Battle for America's Soul* (2008) and *Finding Darwin's God*. Research scientist Robert Hazen, who nominated Miller for the AAAS award, said the latter is "my favorite book on evolution science," adding, "Few scientists have so effectively reached out to the nonscientific community."

Miller is also co-author of one of the most widely used high school biology textbooks, Prentice-Hall's *Biology*. In numerous editions and with millions of copies in print, it is noteworthy, said the AAAS, for its articulate emphasis on evolution as an underlying principle in the life sciences.

the scientists called it "stunning news" and said it was fitting to come on the 200th birthday of Darwin. "The project really is about understanding our evolution," one of the researchers emphasized. The DNA sequenced came from several 38,000-year-old Neandertal fossil bones in a cave in Croatia. A host of novel techniques had to be developed to make it possible. Preliminary results suggest that Neandertals, which went extinct in Europe 30,000 years ago, have contributed, at most, a very small fraction of the variation found in contemporary human populations. Details will come when their study is published.

* * *

What is new and surprising since the Intergovernmental Panel on Climate Change's fourth assessment? That was the title of one session, and the news is not good. IPCC scientist Chris Field of Stanford University and the Carnegie Institution of Science in Washington said there are "startling conclusions. . . . The situation is now more serious than had been considered in the last assessment. . . . We now have data showing that from 2000 to 2007, greenhouse gas emissions increased far more rapidly than we expected, primarily because developing countries, like China and India, saw a huge upsurge in electric power generation, almost all of it based on coal." This rise is "now outside the possibilities" of the IPCC 4 report, released in 2007 but based on earlier data (SI, May/June 2007). Without decisive action, he said, global warming in the twenty-first century is likely to accelerate at a much faster pace and cause more environmental damage than predicted.

The Arctic has long been seen as a place where, due to well-understood ice-albedo feedbacks, melting of the reflective ice amplifies any warming trend. The Arctic is indeed warming faster than anywhere else. One of the big, newer worries now is that melting of the Arctic tundra will release billions of tons of carbon dioxide and methane (a more intense greenhouse gas) into the atmosphere.

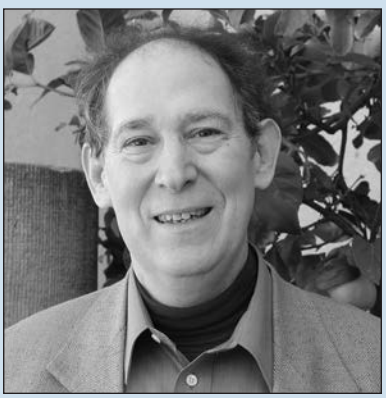
Anny Cazenave of the French Centre National d'Etudes Spatiales chronicled sea level rises. We have known for decades that sea levels have risen fifteen centimeters over the past century. We now have a sixteen-year record of direct measurement of sea levels by satellites. "What we see," she said, "is that sea levels continue to rise at a rate twice as fast as the past-century rate, three millimeters a year." Some of the rise is due to thermal expansion of the ocean as it warms and some to freshwater added from melting ice on Greenland and Antarctica.

(Two data points: Contrary to previous studies, much of Antarctica has warmed in recent decades, Eric Steig of the University of Washington and colleagues reported in the January 22 *Nature*. And NASA's Goddard Institute has processed the global weather observations for 2008 and found that, despite notable cold blasts in Europe and parts of North America, it was still the ninth warmest on record.)

Two scientists warned that use of biofuels can seriously exacerbate the problem. Studies show that forests are the major source of new croplands (80 percent), yet if trees in tropical forests are cut down and burned to make room for growing biofuel crops, all the carbon from the trees will be released into the atmosphere. "Even

Climate Change: Skeptics vs. Deniers

Stephen H. Schneider is a climatologist whose first book about climate and world problems was published way back in 1976 when he was at the National Center for Atmospheric Research. He is now professor for interdisciplinary studies and a senior fellow at the Woods Institute for the Environment at Stanford University. He has long been active in climate policy issues. At this year's AAAS meeting, he was the invited discussant at the session on media coverage of climate change (see main article). The SKEPTICAL INQUIRER *invited him to elaborate briefly on thoughts he expressed there about skeptics vs. deniers.*



All good scientists are skeptical: I changed my mind from cooling to warming in 1974 when the preponderance of evidence shifted—and is now well established. I changed my views on nuclear winter to "nuclear autumn" in 1984, incurring the wrath of the peace movement—again because the preponderance of evidence shifted with study. That is a skeptic, what all scientists should be. But real skeptics still accept a preponderance of carefully examined evidence even when some elements of a complex systems problem remain unresolved, and they do not pretend that when there are loose ends some well-established preponderances don't exist—that is beyond skepticism to denial, or often political convenience. So a skeptic questions everything but accepts what the preponderance of evidence is, and a denier falsely claims that until all aspects are resolved we know nothing and should do nothing—often motivated by the latter. If you deny a clear preponderance of evidence, you have crossed the line from legitimate skeptic to ideological denier.

—STEPHEN H. SCHNEIDER

under the best of scenarios," said Michael Coe of the Woods Hole Oceanographic Institution, "the release of carbon dioxide from new deforestation swamps any savings from burning biofuels." Holly Gibbs of Stanford University put it this way: if we remove forests to grow biofuels for our cars, "We would effectively be burning tropical rainforests in our gas tanks." She said any biofuels should instead be grown on degraded or marginal lands.

A lively session titled "Hot and Hotter: Media Coverage of Climate Change Impacts, Policies, and Politics" featured science-writer veterans of climate-change coverage lamenting the severe downsizing of newspaper and television science news staffs left to cover the challenges posed by climate change. It was organized by science journalist Christine Russell of the Belfer Center for Science and International Affairs at Harvard and physicist John Holdren, also of Harvard. (Russell apologized for Holdren's absence at the session. He was undergoing confirmation hearings in Washington to become President Obama's science advisor.)

Peter Spotts of the *Christian Science Monitor* (about to terminate its print edition) said his personal challenge in covering climate change is "to avoid becoming so bummed by the science to not be cynical about policy." He said human-triggered change beyond the levels we have today is inevitable. Ocean acidification as the oceans warm is proving to be the "evil twin" of global warming: "It's a Siamese twin. It can't be surgically separated." He said *adaptation* "is a term finally let out of the doghouse." Deemphasizing adaptation was a strategic choice in order not to dilute the message about emissions, but "the adaptation issue is really critical," he said. "We have a world that's changing and have to figure out ways to manage it."

Pallab Ghosh, a BBC science correspondent, said, "Our job is to honestly and accurately and critically" cover the climate news "to make sure our viewers trust us." In covering climate change, he said science journalists must guard against hype and exaggeration, such as headlines like "Melting Ice Doomsday" or "Most Life Would Be Exterminated." But he also criticized some publications that exaggerate in the other direction. A British tabloid newspaper published a series titled "The Great Climate Conspiracy" based essentially on the Michael Crichton novel *State of Fear*. "He [the tabloid writer] said there is 'actually very little scientific agreement' about climate change," Ghosh complained. "Hasn't he read the IPCC climate reports? How does this get into a mainstream paper?"

Bud Ward of the Yale Forum on Climate and Media, who covered environmental issues for thirty years in Washington, also spoke and afterward received the 2009 Climate Change Communicator of the Year award.

Veteran climatologist Stephen H. Schneider of Stanford University spoke

Keep Covering Climate Change, Evolution Despite Naysayers

David Perlman, longtime science editor of the San Francisco Chronicle*, is the dean of American science writers. He was given a surprise special award for lifetime achievement at the AAAS Kavli Science Journalism Awards in Chicago and spoke very briefly. Because they are so relevant to our concerns, we invited him to expand on his remarks for this issue of the* SKEPTICAL INQUIRER.

There are two big subjects we science writers need to cover as often as possible: climate change and evolution. The first because whenever new solid data comes in it's an important story, and the naysayers are actively producing spurious contravening data that gets in too many news venues—paper or electronic—and spreads doubt and confusion. And the second because the opponents of evolution are causing trouble in every school district in the country, and the facts need to be underscored in any biology story we write.

I invariably get protests from individuals and organizations on global warming—much of it like this:

"The real truth is that the Earth has been cooling since its original formation." "The global warming alarmists will lead the lemmings over the cliff on their way to a socialist utopia."

As for evolution, advocates of "intelligent design," once openly called "creation science," are belaboring school boards and individual biology teachers, making the real job of science teaching more and more difficult—and this in spite of the clear mandate in the judge's ruling in the Dover case that ID is religion, not science, and can't be taught in science courses under the Constitution.

So I look for good evolution-type stories and constantly get protests like this one:

"*Your biased support for Darwinian evolution is propaganda, not fact. Reptiles do not and cannot change into birds.*"

(This after Kevin Padian's work demonstrating that birds are in fact "modern dinosaurs"—as I told the e-mailer.)

But my standard short answer is: "I cover science, our religion writer covers religion."

—DAVID PERLMAN

of scientific uncertainties and caveats, enumerating the pitfalls scientists face when they enter the advocacy arena of policy. "In science if you don't try to assign risk, it's unethical. But in an advocacy world, everyone spins for an agenda. It's not a level playing field." And with climate change, he said, "Denialists take any caveats given by a scientist and use them against him." (See sidebar "Climate Change: Skeptics vs. Deniers.") Nevertheless, he argued that scientists must not avoid policy issues. "Some scientists say it is irresponsible to play in this game; it's unobjective," Schneider said. "But that very view is unobjective. It is a personal value judgment." What's needed, he said, is "to separate the facts part from the advocacy," and to be effective, scientists need to learn the larger context of their own work. As for the amount of expected global warming, whether it's going to be two degrees Celsius "which is not good," or six degrees Celsius, "which is catastrophic," he said we are not soon going to know any better which of these possibilities is the case. That's true scientific uncertainty.

* * *

One of the real highlights for me and the large ballroom audience was a late afternoon plenary lecture by University of Wisconsin molecular biologist (and CSI fellow and SI author) Sean Carroll on Charles Darwin, Alfred Russel Wallace, and Henry Walter Bates. The emphasis was on these three as very young naturalists setting off on long expeditions to study and collect in the New World, ending up discovering that evolution occurs and works through natural selection. Carroll's "Remarkable Creatures: Epic Adventures in the Search for the Origin of Species" was a beautiful multimedia presentation that began and ended with videos of Earth's remarkable animals and plants, set to music by U2, among other groups. In between we heard and saw (through visuals and their handwritten accounts) Darwin's, Wallace's, and Bates's epic adventures, passions for collecting, observations of life's enormous variation, and resulting insights. The result was Darwin and Wallace independently realizing special creation was dead and deducing natural selection as the mechanism of evolution. There was also suffering (Bates spent eleven years in the Amazon, went farther upriver than any other European and discovered 8,000 species new to science, got robbed, and, like Wallace, contracted malaria); tragedy (Wallace lost all of his extensive collections and almost his life when his England-bound ship caught fire and sunk); remarkable grace (Wallace deferring to Darwin); and longtime mutual friendship and respect among the three of them. Carroll's was a remarkable tribute to Darwin (and Wallace and Bates, too) on the Darwin bicentennial and a powerful example of scientific communication.

* * *

An hour later in the same packed ballroom, former vice president Al Gore spoke. Gore may be reviled by those who question climate change and think of him only as a politician ("I'm a recovering politician," Gore joked of himself), but it is clear he is deeply

Darwin (Yes!) Is Project Steve's 1,000th Signer

The 1,000th "Steve" to sign up on behalf of evolution in the Steve Project is . . . Steve Darwin. Yes, that's the real name of the Tulane University professor of ecology and evolutionary biology whose signature brought to an even thousand the number of "Steves" who have signed the National Center for Science Education's petition affirming evolution.

He's no relation to Charles Darwin, but Steve Darwin has been a botanist and evolutionary scientist for thirty years and is also director of Tulane's herbarium, which boasts 115,000 specimens, and author of thirty-five publications on plant biology.

With a noticeable twinkle, NCSE's executive director Eugenie Scott handed out the news release announcing the thousandth Steve at the Chicago AAAS meeting. The statement says, among other things: "Evolution is a vital, well-supported, unifying principle of the biological sciences."

Steve Darwin

NCSE started the tongue-in-cheek campaign to sign up Steves a few years back to make the point that even if one takes some small subset of the scientific community, say, persons named Steve—chosen to honor the late evolutionary biologist Stephen Jay Gould—it is easy to find hundreds of supporters of evolution. "Project Steve is a lighthearted stunt—but it is in reaction to the very serious threat to scientific literacy posed by the relentless efforts of creationists," said Scott. "We urge everybody, whether named Steve or not, to join in defending the teaching of evolution."

"This is the first time that being a Darwin—or a Steve—has paid off!"

respected by much of the scientific community. This was the fourth time Gore had addressed the AAAS but the first since he received the Nobel Peace Prize for his work in alerting the world to climate change. Gore was received with great warmth. He returned the respect, thanking several of the scientists in the audience who have tutored him about climate change and kept him anchored to good science. James McCarthy, the outgoing AAAS president, introduced Gore saying, "No one has done more for the public acceptance of climate science." For his part, Gore said, "Jim has been one of my mentors for many years now." Gore reported that ten of the hottest years on record have been in the last eleven years. He showed satellite images from two days earlier and imagery documenting not only the diminishing areal extent but also the diminishing thickness of northern hemisphere sea ice over the past thirty years. "Estimates are that it may be completely gone in the summer months in five years."

Gore concluded his talk with an emotional appeal to scientists to communicate more about climate change. "We need you to be actively involved. The survival of our civilization is at risk. Start getting involved in this historic debate. We need you."

* * *

On Sunday morning, the Nobel laureate physicist (and CSI fellow) Leon Lederman spoke informally at a media breakfast. "It has been, for me, an extraordinary meeting," he said. He obviously was still much moved by Gore's presentation. "[Gore] was mind-boggling in his sincerity, and he even gave new data," Lederman said. "What Gore did for me the other night because he was so passionate in the last twenty minutes of his talk . . . was [make me determined] never to go anywhere anymore without global warming as my chief topic." Lederman had watched the Gore presentation from the front row, sitting next to Steve Schneider, who he noted had once been his physics student.

Photo: JCOLLELAPHOTO.COM

CSI Fellow Steve Carroll.

"Steve is very discouraged that we have done so little."

* * *

A Sunday afternoon session was also notable. Organized by anthropologist Eugenie Scott, executive director of the National Center for Science Education (and also a CSI fellow), the session was inspired by Theodosius Dobzhansky's now-famous dictum (he wrote it in *American Biology Teacher* in 1973): "Nothing in biology makes sense except in the light of evolution." Scott suggested that the statement be a model for scientists in how science can be communicated effectively. "Scientists can make clear when they teach evolution that evolution makes sense of biology. It's a useful way to teach biology. Things in your field are how they are because of evolution."

The symposium was aptly titled "Evolution Makes Sense of Biology." After an introductory talk by Scott's co-organizer and NCSE colleague Joshua Rosenau on why we need Dobzhansky's maxim more than ever ("without evolution, biology becomes a pile of sundry facts"), the symposium consisted of five talks, each beginning with the title "Evolution Makes Sense of. . . ." They were by noted specialists in five fields: David Deamer (University of California, Santa Cruz), "Biochemistry"; Kenneth R. Miller (Brown University), "Cell and Molecular Biology"; Sean B. Carroll (University of Wisconsin), "Developmental Biology" (Carroll couldn't make this session but Miller helpfully included some of Carroll's points in his talk); Neil Shubin (University of Chicago), "Anatomy"; and Olivia Judson (Imperial College, London), "Behavior."

"Some of the strongest evidence supporting the factual basis of evolution comes from understanding life at the molecular level," said Deamer. "With the powerful new tools of genomics and bioinformatics, we can read the evolutionary script of life, and its history, that is written into the sequences of bases in DNA and RNA.

"Another remarkable feature of our modern understanding is that evolutionary processes are no longer confined to living organisms, or even to life on the Earth. At the nanoscale, using enzymes that replicate and amplify nuclear acids, it is possible to watch evolution happen in non-living systems, and even direct the process toward predetermined goals

The Great Global Cooling Myth and the Politics of Science

JOHN FLECK

Those who follow the political debates over climate change may have heard about a March 1975 article in the venerable *Science News* that predicted the coming of "a full-blown 10,000-year ice age" (Douglas 1975). Over the years, the quote has taken on a starring role in arguments against those who believe humans are causing global warming. If scientists in the 1970s were predicting an imminent ice age, the argument goes, how can their forecasts of greenhouse warming today be trusted?

The "full-blown 10,000-year ice age" quote made its most recent appearance in February 2009 in a *Washington Post* column by George Will (Will 2009), but it is only the latest of many occurrences, in various forms, since at least the early 1990s.

It is a rhetorically effective argument, widely deployed by global warming skeptics: "Before we are stampeded into growth-inhibiting actions to combat global warming, we should recall that less than twenty years ago, not long in a planet's life, the politically correct panic concerned global cooling," Will wrote in one of the quote's first incarnations (Will 1992).

The argument is false. Scientists in the 1970s did not predict imminent global cooling or a looming ice age. In fact, even then, a forecast of warming as a result of greenhouse gas emissions dominated the scientific literature. The growth of the "1970s global cooling" argument illustrates the minefield that awaits when science leaves the academy and enters the arena of politics.

How did the global cooling myth come to be? Thomas Peterson of the National Climatic Data Center, William Connolley, formerly of the British Antarctic Survey, and I did a comprehensive survey of the scientific literature of the time in an effort to find out (Peterson et al. 2008).

Like all good misinformation that travels well and lasts long, we found a kernel of truth. But we also found the deep foundations on which the now widely accepted hypothesis of greenhouse-induced anthropogenic climate change is based.

In the early1970s, Earth was cooling, a global trend that began in the mid-1940s. The first global temperature estimates, painstakingly assembled from individual weather station records, were only just becoming available. In the early 1970s, the latest data showed a cooling trend that scientists did not understand. At the same time, separately, scientists were nailing down the sequence and timing of past ice ages, a sequence that suggested that the ice would eventually return. Yet another group of scientists was studying the effect of aerosol pollutants, which they realized could also contribute to cooling.

At the same time, other scientists began to look at the possible role of increased carbon dioxide emitted when fossil fuels are burned. It was an idea first suggested in the mid-nineteenth century by British scientist John Tyndall. Swedish scientist Svante Arrhenius ran the numbers on Tyndall's idea in 1896 and concluded that a doubling of atmospheric carbon dioxide would

Like all good misinformation that travels well and lasts long, we found a kernel of truth. But we also found the deep foundations on which the now widely accepted hypothesis of greenhouse-induced anthropogenic climate change is based.

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increase Earth's temperature by as much as 6 degrees Celsius.

It was not until the 1950s that technology allowed measurements of carbon dioxide with sufficient precision to detect an anthropogenic influence. Charles David Keeling established observatories atop Hawaii's Mauna Loa and in Antarctica, far from confounding influences of forests and human habitation, and began developing what has become one of science's iconic graphs. The Keeling Curve, as it has come to be known, shows the annual pulsing of the carbon dioxide in Earth's atmosphere as northern hemisphere plants take up carbon during their growing season and release it when they are dormant. It is literally the breathing of the biosphere. Superimposed on that annual cycle is the inexorable rise as a result of fossil-fuel burning.

By the 1970s, scientists were making detailed calculations trying to fit those varied climatic influences into a coherent picture. Our survey of the literature focused on the period from 1965 to 1979, the period most frequently cited as the time when scientists were predicting global cooling. Our survey found the contrary: seven papers predicting cooling, twenty that were neutral, and forty-four that predicted global warming as a result of carbon dioxide emissions.

If that is what the scientific literature of the time said, why has the myth been so persistent? One simple reason is repeated misreading of the primary literature that, once quoted, is merely repeated in the echo chamber of climate-change political debate without reference to the original source material.

One famous example appears to have originated in a 2003 op-ed piece by James Schlesinger, who under Jimmy Carter was the nation's first Secretary of Energy. Schlesinger quoted a 1972 National Science Board report as saying: "Judging from the record of the past interglacial ages, the present time of high temperatures should be drawing to an end . . . leading into the next glacial age." The quote was widely repeated, even making its way into a speech on the floor of the U.S. Senate by Sen. James Inhofe, R-Oklahoma.

Reference to the original shows that the report immediately goes on to say that such an ice age could happen "some 20,000 years from now" but that human interference in climate, including from greenhouse emissions, could change that path.

So did Douglas, in his 1975 *Science News* article, simply get it wrong? No. At this point it should be unsurprising to learn he is simply being selectively misquoted. Those seven words that have become something of a talisman for global warming skeptics—a discussion of the possibility of "a full-blown 10,000-year ice age"—did in fact appear in the article. The article then goes on at some length to talk about the uncertainties of the day—that the short cooling trend is insufficient to base any long-term projections on and that greenhouse warming would also be an important factor.

If Will and others who make the argument genuinely believe scientists' mistaken predictions of global cooling back in the 1970s are relevant to today's debates over how to best incorporate climate science into twenty-first-century politics and policies, it seems that it would have been incumbent on them to go back to the record and look at what those mistakes were and how they were made. The evidence Peterson, Connolley, and I found shows that this was never done. Had they gone back and looked carefully, they would have found their own argument was flawed, suggesting that the "1970s global cooling myth" was, and remains, more a political debating point than a serious argument. □

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Repower America? Science Communication and the Obama Presidency

MATTHEW C. NISBET

President Barack Obama's new administration faces a host of science-policy challenges that are likely to demand a rethinking of traditional approaches to public communication. Some challenges, such as passing meaningful climate-change legislation, will require the application of principles from political campaigning. Other challenges—such as engaging the public on the risks and ethics of biomedical research, nanotechnology, and neuroscience—will require government agencies and scientists to adopt new modes of communication, directly involving the public in decision making. To be successful in each area, the Obama administration will need to boost funding for science communication research and initiatives.

On climate change, polls show that a sizable proportion of Americans continue to refute the idea that human activity is at the root of the problem (Dunlap and McCright 2008), while the issue consistently ranks near the bottom of the public's policy priorities (Nisbet and Myers 2007; Pew 2009). In the context of an economic recession and two wars, absent a shift in the polls and a surge of input from a diversity of constituents, it is unlikely that fence-sitters in Congress will take on the political risks of passing major policy initiatives such as a cap and trade bill or ratifying a major international treaty.

The continued perceptual gridlock on climate change has little to do with science literacy, a lack of respect for science, poor reporting on the part of journalists, or a decline in the science beat at major news organizations such as CNN. Indeed, it is time to stop blaming the public, journalists, and media conglomerates. The communication burden instead rests with political leaders, scientists, advocates, and policy experts.

It is time to turn the page on the "war on science," "inconvenient truths," and "denier" rhetoric that were battle cries for the left during the Bush administration and the 2008 election. The raw emotion that continues to fuel this focus is in part understandable. Earlier this decade, when groups needed to be rallied to defend science, these frame devices served a purpose.

But in the Obama era, they are self-inflicted wounds. This continued narrative is likely to be viewed by the wider public as just more elite rancor. Worse, the message alienates Republican audiences, the very group that now needs to be rallied behind Obama's climate-change proposals.

It is also time to stop focusing narrowly on remote polar impacts, looming environmental disaster, or symbols such as polar bears. These examples are either not personally relevant enough to most audiences, are dismissed as remote and far off in the future, or easily reframed as "alarmism," sending interpretations back into the mental box of lingering scientific uncertainty (Maibach, Roser-Renouf, and Leiserowitz 2008; Moser and Dilling 2004).

In short, not every citizen cares about melting ice or polar bears, heeds warnings of impending hurricane disasters, or becomes angry over the political tricks of "climate deniers," yet these mental points of reference continue to be the dominant emphasis in news coverage and among many climate advocates. Only by reframing the relevance of climate change in ways that connect to the specific core values of key segments of the public—and repeatedly communicating these multiple meanings through a variety of trusted media sources and opinion leaders—can the Obama administration generate the widespread public resolve needed to move major policy action forward (for an overview on framing and climate change, see Nisbet 2009).

In searching out possible examples, the Obama administration should follow the lead of Al Gore's WE campaign, which has emphasized the moral and religious duty to "repower America" through new

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energy technology and increased energy efficiency. WE campaign advertisements compare action on global warming to the struggle to win World War II or to the civil rights movement. More recent WE television spots, which feature actors as ranchers, construction workers, and auto workers, emphasize clean-energy policies as leading to job creation and growth (Nisbet 2008). Importantly, these ads are placed during daytime talk shows, entertainment programming, and in leisure magazines, all of which reach non-news audiences who might not otherwise be paying attention to news coverage of the issue (Eilperin 2008).

The Obama administration—and many scientists—can also look to the example of biologist E.O. Wilson. In his best-selling 2006 book *The Creation: An Appeal to Save Life on Earth*, Wilson frames environmental stewardship as not only a scientific matter but also as a moral imperative. In penning the book as an open letter to a Baptist minister, he acknowledges that as an atheist, he might hold a different belief regarding the origin of the earth, but he shares a common value and respect for nature, what the Bible symbolically calls "creation."

Within this frame, Wilson has engaged Christian readers and media outlets that might not otherwise pay attention to popular science books or appeals related to climate change. Paralleling Wilson's interpretation, an increasing number of Christian leaders, including Pope Benedict XVI and evangelicals such as Richard Cizik and Rick Warren, are emphasizing the religious duty to be "stewards" of God's creation.

This positive narrative that emphasizes shared common ground among Americans resonates with Obama's personal style and his presidential campaign strategy. It is also likely to be far more effective at mobilizing broad-based public support for climate action than dwelling on Bush administration attempts to distort science or the continued efforts of so-called "deniers."

On issues such as nanotechnology, biomedical research, and neuroscience, there is a pressing need for a shift from decades-old approaches that focus narrowly on communicating with the public through popular science depictions in newspapers and magazines and on television and Web sites. The greatest weakness in these traditional approaches is that they tend to reach only a small audience of already informed science enthusiasts. Research shows that most individuals typically lack the time, motivation, and ability to pay close attention to quality science coverage and to carefully assess scientific issues or policy debates. Instead, just as they do in purchasing consumer goods or voting in elections, individuals rely on a variety of mental shortcuts to reach judgments (Popkin 1991; Nisbet 2005; Scheufele et al. 2009). In addition, with today's increased media choices, it is very easy for audiences who lack a preference for science news to avoid such information all together, instead only paying close attention to entertainment media or just a few public affairs topics (Prior 2005).

Popular science approaches erroneously define communication as a process of transmission. The facts are assumed to speak for themselves and to be interpreted by all citizens in similar ways. If the public does not accept or recognize these facts, then the failure in transmission is blamed on ignorance, "irrational" public beliefs, or both. Unfortunately, condescending claims of "public ignorance" too often serve to further alienate key audiences, especially in cases such as evolutionary science or biomedical research, when these charges are frequently mixed with atheist critiques of religion. Moreover, by emphasizing what is wrong with the public, scientists ignore the possibility that their communication efforts might sometimes be part of the problem (Nisbet and Goidel 2007).

As an alternative model, the Obama administration should look to European communication initiatives that have shifted from a mode of mass media transmission to community-based conversation. On topics such as nanotechnology, government agencies and science institutions should sponsor deliberative forums, open meetings, and consensus conferences. In these initiatives, participants hear from experts and stakeholders and then provide their own input on what should be done in terms of policy. Studies of pilot programs in the U.S. find that lay participants at these meetings not only learn about the science and politics involved, but they also end up perceiving relevant institutions as more responsive to their concerns and leave the forum with enhanced feelings of trust. If these initiatives are going to be genuine public engagement efforts, however, then policymakers and scientists need to be prepared that sometimes well-informed citizens might prefer policies that cut

It is time to turn the page on the "war on science," "inconvenient truths," and "denier" rhetoric that were battle cries for the left during the Bush administration and the 2008 election.

against the direct interests of science (Borchelt and Hudson 2008; Besley et al. 2008).

Community initiatives of a different kind should focus on building a "participatory" public media infrastructure for science and environmental information. Most local newspapers have cut meaningful coverage of science and the environment. As a result, many communities lack the type of relevant news and information that is needed to adapt to environmental challenges or to reach collective choices about issues such as nanotechnology and biomedical research.

As a way to address these local-level information gaps, the Obama administration should fund public television and radio organizations as community science-information hubs. These initiatives would partner with universities, museums, and other local media outlets to share digital content that is interactive and user-focused. The digital portals would feature in-depth reporting, blogs, podcasts, shared video, news aggregation, user recommendations, news games, social networking, and commenting.

We should think of these new models for nonprofit science media as an integral part of the infrastructure that local communities need to adapt to climate change, to move forward with sustainable economic development, and to participate in the governance of science, medicine, and technology. A community without a quality source of science information—packaged in a way that is accessible and relevant to most members of that community—will be ill prepared to make careful decisions about costs, risks, benefits, and ethics.

Finally, each of these possible new directions in science communication needs to be informed by the funding of careful formative and evaluative research. The results of this research can be useful to government agencies and nongovernmental organizations seeking guidance on the design and targeting of messages about climate change, for conveners of public dialogue initiatives on issues such as nanotechnology, and for journalists and media partners launching community-based participatory media collaborations that are accessible and relevant to nontraditional audiences. □

In short, not every citizen cares about melting ice or polar bears, heeds warnings of impending hurricane disasters, or becomes angry over the political tricks of "climate deniers," yet these mental points of reference continue to be the dominant emphasis in news coverage and among many climate advocates.

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INVESTIGATIVE

Demons in Connecticut

Shades of *The Amityville Horror!* Take a house reeking of death, bring in a "demonologist," commission a professional writer to enhance the alleged events, Hollywoodize the resulting book into a horror/thriller flick, and shamelessly bandy about the word *true* in promotional copy. This formula lured moviegoers to *The Amityville Horror* (1979); now—current hucksters hope—*The Haunting in Connecticut*, "based on true events," will entice a new generation of credulous screamers. But here is some of the real truth I encountered in my investigation of the case in 1992 and 1993.

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Background

It's an old story—in more ways than one. In 1986 the family of Allen and Carmen Snedeker (respectively a stone-quarry foreman and former bowling alley cocktail waitress) moved into an old residence, known as the Hallahan House, in Southington, Connecticut. The family included three sons, ages thirteen, eleven, and three (the two oldest being Carmen's by a previous marriage), and a six-year-old daughter; two nieces would later follow.

It is disputed whether the Snedekers knew when they moved in on June 30 that the house had been a funeral home. They maintained they did not; however, some neighbors insisted otherwise, and the previous owners emphatically stated that the Snedekers were informed of the house's former use prior to their moving in. In any case, the family soon discovered in the basement a box of coffin handles, a chain-and-pulley casket lift, and a blood drainage pit—unmistakable relics of the previous business, the Hallahan Funeral Home.

The creepy setting may well have had a powerful suggestive effect. Spooky phenomena began with the oldest son, Philip, whose basement bedroom was adjacent to the gruesome area. Soon he reported seeing ghosts, although his parents say they first attributed this to cobalt treatments he was receiving for Hodgkin's disease. Philip's personality changed drastically: he began wearing leather, developed an interest in demonology, and even report-

Image source: Lionsgate

An image from the Lionsgate feature film *The Haunting in Connecticut.*

edly broke into a neighbor's home, telling his mother he wanted a gun so he could kill his stepfather (Corica and Smith 1988a; Rivard 1988; Carpenter 1988).

The phenomena allegedly continued for two years. A seventeen-year-old niece claimed an unseen hand fondled her on occasion as she lay in bed, and there were many other reported occurrences, including more apparitions, noises, and physical attacks—especially alleged demonic sexual attacks on Carmen Snedeker (Carpenter 1988; Corica and Smith 1988a).

Then the Snedekers brought in notorious "demonologist" Ed Warren and his "clairvoyant" wife Lorraine. The couple made a business—some would say a racket—of spirits. They came to be called many things, ranging from "passionate and religious people" to "scaremongers" and "charlatans" (Duckett 1991). Already having helped promote the Amityville "horror" and a similar West Pittston, Pennsylvania, "nightmare" (Curran 1988), they continued their *modus operandi* of arriving at a "haunted" house and transforming the case into a "demonic" one, in keeping with their own medieval-style Catholic beliefs. (Like the Lutzes at Amityville and the Smurls at West Pittston, the Snedekers were self-described devout Catholics.)

Bringing with them two "psychic researchers" (the Warrens' grandson and nephew), Ed and Lorraine Warren moved into the house for nine weeks. While denying there was any book deal in progress, the researchers had in fact made just such an arrangement. Mrs. Snedeker had already told her upstairs neighbor about the deal, saying she and her husband were to receive one-third of the profits (Carpenter 1988; Corica and Smith 1988a, 1988b).

Soon both Al and Carmen Snedeker were publicly claiming to have been raped and sodomized by demons—the same claim made in a previous case involving the Warrens (Nickell 1995, 131). They would repeat these claims on national television shows—notably on *Sally Jessy Raphael*—to promote their book with the Warrens, *In a Dark Place: The Story of a True Haunting* (Warren, et al. 1992). It was written with professional horror-tale writer Ray Garton and timed—like the *Sally* show—for Halloween promotion, 1992.

Investigation

Although I had earlier appeared with Carmen Snedeker on *The Maury Povich Show* (taped March 2, 1992), my investigation intensified when *Sally Jessy Raphael* producers sent me an advance copy of the Warrens and Snedekers' book and invited me on the show. I later visited Southington as a guest of one of the Snedekers' neighbors.

On the *Sally* show (taped October 19, aired October 30), I appeared with the Warrens and Snedekers as well as several of the latter's skeptical Southington neighbors. Ed made veiled threatening asides to me (not aired) and, offstage, swore like a sailor. During the taping, the Snedekers sat on a brass bed while telling their story of demonic sexual attack.

Among their most effective critics was Mrs. Kathy Altemus, who lived across the street from the Snedekers during their entire residence in the Hallahan House. Beginning in mid-July 1988, Mrs. Altemus kept a journal of events relating to 208 Meriden Avenue. As she told Sally, "I discovered that there were usually things going on in the neighborhood that explained the things they put in the newspaper." The journal—which she generously shared with me to help "expose the truth" (Altemus 1993)—juxtaposes her written records with news clippings arranged chronologically. The result is revealing. For instance, the television program *A Current Affair* mentioned the sound of clanking chains in the house, presumably from the coffin lift in the basement. But Mrs. Altemus's journal shows that the noise most likely was from a truck that passed by, making a sound like it was "dragging a chain." Other events also had credible explanations, some attributable to various passersby mentioned in the journal as "pulling pranks on the 'haunted house'" (Nickell 1995, 137, 147 n. 98),

The journal also sheds light on another event. As sensationalized in the *New Britain Herald*, either a "bizarre coincidence or ghost" was indicated by a power outage—caused by a tree limb that fell onto an electrical line outside the Hallahan House just after *A Current Affair* broadcast "a segment

"If the ghosts really are there, then why did the Snedekers stay there over two years and why are they staying there now? Are they looking for publicity or profit, or what?" the landlady said.

on the Snedeker family of that address." According to the paper a utility spokesman "was at a loss to explain just why the limb chose that particular time to knock out the power." In fact, however, the incident did not occur at the time of the television program but approximately two hours later. Besides, as the journal makes clear, such outages have occurred several times on tree-lined Meriden Avenue, when limbs have fallen on the uninsulated line. Such an event, in fact, actually occurred when I was in Southington at the Altemus home in June 1993. It seems unlikely that demonic forces were heralding my arrival or had no better means of attempting to scare me away.

Long before the *Sally* show, in response to the Warrens' shameless media exploitation, the Snedekers' landlady—who had served them with an eviction notice for failing to pay their rent—had responded to the supernatural claims. She and her husband, she said, had owned the property for two and a half years and experienced no problems with it.

"Personally, my husband and I do not believe in ghosts and to us, the whole issue seems ridiculous. I find it ironic that after more than two years as tenants, suddenly we are told about these alleged ghosts and then read in the paper that the Warrens will be conducting a seminar and will be charging the public for it.

"If the ghosts really are there, then why did the Snedekers stay there over two years and why are they staying there now? Are they looking for publicity or profit, or what?" the landlady said (qtd. in DiMauro and Starmack 1989).

The Snedekers' upstairs neighbor had similar views. Calling the Warrens "con artists," she said: "I haven't experienced anything. I definitely know that no one has been raped up here." She told reporters that the Warrens, who she was convinced were exploiting the situation for personal gain, "have caused a lot of problems here and they are not ghost problems" (Corica and Smith 1988b).

Other revealing information came to light in Southington—about Philip Snedeker's drug use, vandalism, and other misbehavior. There was even an explanation for the sexual touching that Carmen's niece had felt "from an unseen hand." The boy was actually caught fondling his nieces while they slept. "Steven" (as he is called in the book) "was taken away by the police that afternoon. He was questioned, at which time he confessed that he'd been fondling the girls while they slept at night, and that he'd attempted unsuccessfully to have sex with his twelve-year-old cousin." He was later taken to the juvenile detention center, where a psychiatrist diagnosed him as schizophrenic (Warren et al. 1992, 145–147).

Conclusions

Many people branded the Warren-Snedeker-Garton book fiction. Said the husband of the Snedekers' landlady: "It's a fraud. It's a joke. It's a hoax. It's Halloween." He added, "It's a scheme to make money." Those comments appeared in a brilliantly titled newspaper article (Schmidt 1992), "Couple sees ghost; skeptics see through it." As indicated by the evidence—the publicity-seeking actions in the case and the timing of the book for Halloween promotion—there is reason to doubt the motives of those involved. If the case did not originate as a hoax, I concluded from my original investigation (Nickell 1995, 139), people could scarcely be blamed for thinking it has been transformed into one.

Subsequent developments have only supported that conclusion. Some of the co-authors of the Warrens' books have reportedly since admitted that Ed Warren (who died in 2006) told them to make up incidents and details to create "scary" stories (Nickell 2006). Ray Garton, the award-winning horror writer who wrote the book about the Southington case—on which *The Haunting in Connecticut* movie is based—has now effectively repudiated that book. He says he is glad that it went out of print, adding: "The family involved, which was going through some serious problems like alcoholism and drug addiction, could not keep their story straight, and I became very frustrated; it's hard writing a non-fiction book when all the people involved are telling you different stories" ("Ray Garton" 2009). So much for the movie being "Based on True Events." □

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Hard and Soft Science: Physics vs. Psychology

While doing research for my next book on the differences among so-called hard science, soft science, and pseudoscience, I came across a little-known study published in 1987 by Larry Hedges, then at the Department of Education at the University of Chicago. Hedges was empirically addressing the sort of question that is usually left to a philosopher of science: if it is true—as it is often claimed—that physics (the queen of the hard sciences) "performs" much better than psychology (arguably the Cinderella of the soft sciences), one ought to be able to show, data in hand, that results from physics experiments are "better" than results from psychological experiments. But better in what sense?

Hedges thought that the difference between the two sciences should be evident in the "cumulativeness" of their results: physics should be making progress more steadily and at a faster pace than psychology. This is an important criterion because lack of progress, i.e., lack of cumulative results over time, is one of the distinctive features of pseudoscience. For instance, the idea of intelligent design in biology has made no progress since its last serious articulation by William Paley in 1802. Compare that to the stunning advances in the field of evolutionary biology since Darwin's publication of *On the Origin of Species* in 1859, and one has a good picture of the difference between science and pseudoscience.

As Hedges immediately recognized, however, cumulativeness in science can mean two very distinct, if related, things: on the one hand, one could examine theoretical cumulativeness, i.e., the advancement of a scientific field in terms of how well its theories account for how the world is. For instance, astronomy advanced by a giant leap when it abandoned the Ptolemaic, earth-centered view of the solar system in favor of the Copernican, sun-centered system. Then it made smaller but significant advances by realizing that the planets move in elliptical, not circular orbits; by discovering that the sun is only one star among billions in the Milky Way; and finally by placing our galaxy itself as only one of billions existing in the universe. Judging theoretical cumulativeness, however, is not simple, as it involves a degree of subjectivity, and—more crucially—it requires a long historical perspective. Psychology is a relatively novel science, and it would therefore be rather unfair to compare its theoretical advances with those of modern physics or astronomy, which have

It turns out that the replicability of research findings in psychology (and therefore, presumably, the resulting empirical cumulativeness of that discipline) is no worse (or better) than the replicability of findings in particle physics.

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had a much longer history.

What then? Hedges opted for a more tractable measure of progress, focusing on empirical cumulativeness. The idea is that if physics, psychology, or any other science is really successful at describing the world as it is, then at a minimum its empirical results (from observation or experiment) ought to be consistent from one publication to another. To put it simply, if Earth is really round with a diameter of about 12,700 kilometers, the different methods to estimate its shape and size ought to yield approximately the same result. If it turns out that some measurement gives us 3,000 kilometers while others go up to as much as 100,000 kilometers, then there is something seriously wrong with the way we do the measurements. Again, the comparison with pseudoscience is obvious: some creationists, for instance, believe that Earth is about 6,000 years old, while others accept the geological figure of four billion years, give or take. This is a staggering discrepancy of five orders of magnitude, which betrays the fact that creationists really have no idea how old Earth is or how to measure it; in turn, this is yet another indication that creationism is no science.

So Hedges went about sifting the literature in particle physics (la crème de la crème in physics research) as well as in a variety of psychological fields, including studies of sex differences, of students' ratings of teaching, of the effect of racial desegregation programs, and others meant to provide a range from quasi-hard psychology (sex differences) to as-soft-as-it-gets research (desegregation studies). He used standard statistical tools to tabulate and compare the results of a variety of studies published over a period of years in several specialized journals.

The results were rather stunning. It turns out that the replicability of research findings in psychology (and therefore, presumably, the resulting empirical cumulativeness of that discipline) is no worse (or better) than the replicability of findings in particle physics. As Hedges put it: "What is surprising is that the research results in the physical sciences are not markedly more consistent than those in the social sciences. The notion that experiments in physics produce strikingly consistent . . . results is simply not supported by the data."

It also turns out that some of the results in physics are much less reliable than one would think. For instance, Hedges compared the data obtained during two series of experiments aimed at estimating the mass of two fundamental particles, the electron and the proton. These are two of the best-known and best-studied particles, so one would expect a high degree of congruency among the outcomes of different experiments. Alas, this was not the case: experiments performed over a period of years (from the early 1960s through the mid-1970s) clearly show that the various estimates were not consistent with each other and their confidence intervals often did not overlap, meaning that the results were significantly different from each other statistically.

Data like these, of course, should not be interpreted as indicating that physicists have no idea what the mass of the electron or the proton is. For one thing, we now have many more experiments, and their results are much more consistent. Moreover, it's not like the estimates reported by Hedges show the kind of huge variation that would make anyone seriously question fundamental aspects of nuclear physics. But the point remains that even the queen of science sometimes gets things wrong over a period of many years, and the quintessential example of soft science, psychology, actually displays a remarkable and surprising degree of consistency in its results. That's something you can quote

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Eusapia Palladino, the Queen of the Cabinet

Part 1

Eusapia Palladino is considered to have been one of the most gifted mediums of all time. Whether or not she really possessed psychic powers, she is a fascinating study in human psychology. I will devote this and several future columns to her case.

Born on January 21, 1854, in Minervino Murge, a town in the province of Bari in southern Italy, she was the daughter of peasants and had little or no formal education. Her mother died soon after her birth, and her father was apparently killed by thieves when she was twelve.

Neighbors arranged for her to contact a native of the village who was now living in Naples. In Naples, however, the native told her she could live with some foreigners who wanted to adopt and educate a small girl. The arrangement turned out to be disastrous. Eusapia refused every attempt to make her read and write, comb her hair, take a daily bath, and behave like a good little girl.

She was soon on her own again and took temporary refuge with a family known to her, until some other arrangement could be found. She participated in a séance and, according to her account, was able to stimulate spontaneous spiritual manifestations. Little Sapia was only thirteen, but when the family, enchanted by her gift, told her that she could stay as long as she continued to perform strange phenomena, she quickly resolved to please them.

Her séances soon attracted the attention of many learned men, including the eminent criminologist Cesare Lombroso

Eusapia Palladino

and physiologist Charles Richet, a future Nobel Prize winner, who attended various séances with Eusapia and emerged convinced that she was the real thing. This would soon allow her to visit Europe via Paris, Warsaw, Cambridge, Genoa, and so on, where she was tested by some of the leading figures of psychical research of the day.

Although scientists were usually very impressed by her, not all witnesses were satisfied that the possibility of cheating had been completely ruled out. When sometimes she was caught cheating, she would berate her investigators for failing to control her properly, pleading that she could not be held responsible for what she might do while in a trance!

The Sittings in Naples (1908)

In 1908 a very special series of sittings took place in Naples under the auspices of the Society for Psychical Research (SPR) and under the guidance of Everard Feilding, then honorary secretary of the SPR. The "Feilding Report" (Feilding, Baggally, and Carrington 1909), a complete examination of all the séances, was written by Feilding but endorsed by the other members of the committee as well. They concluded in the report that "some force was in play which was beyond the reach of ordinary control, and beyond the skill of the most skilled conjurer." The conditions of the séances were such, they added, that it was impossible to suppose that there were any accomplices. The only conclusion they could draw (with "great intellectual reluctance") was "that there does actually exist some hitherto unascertained force liberated in her presence."

The Feilding Report remained, as

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parapsychologist John Beloff (1993) said, "one of the mainstays of the case for the paranormal and a stumbling-block for skeptics."

Psychologist and conjuror Richard Wiseman (1992a) quite effectively illustrated in the *Journal of the Society for Psychical Research* how the Feilding Report was badly flawed and how the controls against fraud, as described by the investigators, were inadequate. Wiseman took into consideration the hypothesis that an accomplice may actually have been present within Palladino's séance cabinet. This idea stimulated an interesting debate in the pages of the *Journal*, with Wiseman's critics (Barrington 1992; 1993; Fontana 1992; 1993; Martínez-Taboas and Francia 1993) trying to disprove his hypothesis and Wiseman (1993a; 1993b; 1993c; 1993d) responding point-by-point to each criticism.

Aside from the question of whether or not an accomplice was really present at the 1908 Naples séances, what has clearly emerged from Wiseman's work is that the three investigators were simply no match for Eusapia. To further illustrate this point, let's examine an alternative explanation for the Palladino phenomena as described in the Feilding Report (from now on referred to as the report)—one that was dismissed too quickly. Namely, that of her ability to free her limbs via "substitution." Wiseman (1992a) wrote that: "It seems implausible that Palladino would, under these conditions, be able to *continually* perform such trickery" and concludes that "the 'substitution' hypothesis seems able to explain, at best, a relatively small number of reported phenomena" (p. 134). However, a re-examination of a few episodes described in the report and the conditions surrounding them may suggest otherwise.

The SPR Investigators

The SPR first had a chance to examine Palladino in Cambridge, thirteen years before Naples (Hodgson 1895), and on that occasion the experimenters, especially Richard Hodgson from the American branch of the SPR, reached the conclusion that systematic fraud had been used and that there was no adequate reason for concluding in favor of any paranormal agency having been at work during the course of the sittings. However, in consideration of the attention that Eusapia continued to attract among distinguished scientists on the continent, like Camille Flammarion, Marie Curie, Oliver Lodge, Enrico Morselli, and many others, the Society felt that her case could not be lightly dismissed and decided to reopen it.

Since it was clearly felt that the object of the investigation was determining whether the phenomena were due to trickery or not, it was essential that the investigators were knowledgeable of the methods of trickery. But were they really?

In the report the credentials of the three researchers, Everard Feilding, Honorary Secretary of the SPR; W.W. Baggally; and the American psychical researcher Hereward Carrington are given as (pp. 319-320):

> Mr. Carrington has been for some time the investigator for the American Society for Psychical Research, and is the author of a book, *The Physical Phenomena of Spiritualism* . . . , in which is a detailed exposure of the tricks employed by fraudulent mediums, of which he has made a special study. For many years Mr. Carrington has been an amateur conjurer, and is able to reproduce almost any of the slate writing and other "tests" offered by the average "medium." In the course of his work for the American Society he has investigated many cases of poltergeists, physical phenomena, etc., etc., and in all the ten years of such work had never seen anything that he was unable to account for by trickery, which in many cases he could improve upon.
>
> Mr. Baggally has similarly been for many years an investigator of the phenomena of spiritualism and has been especially interested in the physical phenomena. He, also, is an amateur conjurer of much experience. Notwithstanding the fact that he had investigated nearly all the mediums who have appeared upon the spiritualist horizon since the days of D.D. Home, he, like Mr. Carrington, had never yet met with what appeared to him a genuine example of any agency other than that of more or less easily discoverable trickery, and before the experiments with Eusapia, had come to an entirely negative conclusion as to the probability of any genuine physical phenomena.
>
> Mr. Feilding, though not himself a conjurer, had had a reasonably extensive experience in the investigation of physical phenomena and the advantage of a fairly complete educa-

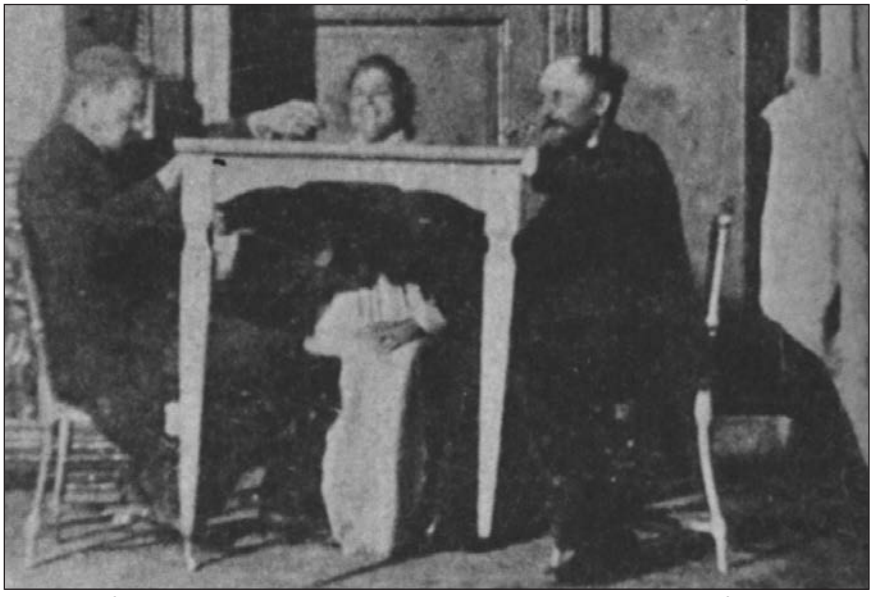
Since it was clearly felt that the object of the investigation was determining whether the phenomena were due to trickery or not, it was essential that the investigators were knowledgeable of the methods of trickery. But were they really?

> tion at the hands of fraudulent mediums. While preserving an open mind as to the possibility of the existence of some hitherto unascertained force in nature whereby the manifestations testified to by so many observers of high standing were produced, the discovery of repeated fraud had produced in him an attitude of complete skepticism as regards the probability of his ever finding any examples of the exercise of such a force.

This certainly sounds impressive, but from what can be deduced by reading the report, the "complete skepticism" and high level of competence of the researchers in detecting trickery must have disappeared somewhere.

Let's examine, for example, an episode that occurred during the eighth séance (pp. 499–500). Sometimes, not as a rule, Eusapia's feet were tied with cords: on this particular séance each foot had been tied with a separate cord to the legs of the experimenters' chairs, at the right and left side of the table. Eusapia asked Feilding to feel the cord of her left leg, to see whether it was fastened. He checked both cords around the left and right leg and found the chords still fastened. After this, Eusapia said she was tired and needed some rest, so she put her head on the table and stayed there while the experimenters thought they had control of her hands. The lights were faint, but the room wasn't completely dark. After two minutes, the experimenters saw one cord being thrown on the table: the other end was still fastened to the experimenters' chair, but Eusapia's left foot was free. It was Baggally, "an expert knot-tier" (p. 504), who had tied the cord with four knots around Eusapia's ankles. They were so tight that, when at the end of the séance he had to unfasten the cord around the other ankle, it took him . . . well, "about two minutes."

This episode could at least have given the experimenters a chance to admit that those knots were not all that difficult to untie surreptitiously, that the cord perhaps wasn't suited for its intended purpose, that the hands of the medium weren't carefully controlled, that the light was insufficient for observing her movements, and in the end, that all of them (there were, for this séance, four more observers) had been unable to prevent Eusapia from freeing herself when she wished to do so. Nothing of this kind ever passed through their minds. On the contrary, even after this fact, they still believed that she was unable to untie herself and listed the "untying of knots" as one of the "marvels" produced at the séances (pp. 330, 340, 557). They don't even refer to the episode in the notes preceding the report of Séance VIII; and in those following it, only Feilding mentions it, lamenting the fact that "Eusapia's 'spirits' or 'fluidic force,' or whatever the agency might be which produced them" had to "intrude into a series of respectable phenomena, one of such indubitably Davenportish associations as the untying of the cord" (p. 504). Not one of them accuses her of fraud.



The Society for Psychical Research investigated Palladino's claims during a series of sittings in 1908 in Naples.

In the next installments I will examine the conditions of the séances in Naples, including the use of lights, the specifics of the table, and the kind of clothing used by Eusapia. All of these elements, we shall see, would turn out to be of real importance in the manifestations of the phenomena. □

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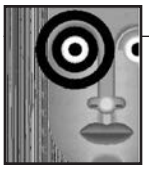

SKEPTICAL INQUIREE
BENJAMIN RADFORD

The Pseudoscience of Personalysis

Q: The company I work for has made quite an investment in a product called Personalysis. I filled out a questionnaire and attended an interpretation session with a lot of broad generalizations, which frankly looked like a close cousin to astrology. Is there anything to this?

—E. Vande Voorde

A: Corporate America is ripe for scams, half-baked twaddle masquerading as insightful business advice, and dressed-up children's books about misplaced cheese. One needs only to peruse the Business section of a local bookstore to see the never-ending parade of schemes. It's the economic version of the self-help section, and there's no shortage of self-promoting business "mavericks" hawking their unique method to improve profits and climb the corporate ladder to success. Not all of them are scams, of course, but a healthy skepticism is especially important in the business world. (For an interesting look at business fads, see Joel Best's book *Flavor of the Month: Why Smart People Fall for Fads*.)

Enter Personalysis, which "since 1975 has worked with progressive, leading, and emerging companies to develop leadership capacity, improve communication, and high performance teams" using "a powerful personality-profiling instrument that accurately captures and graphically illustrates the human assets of an organization. Personalysis takes the guesswork out of understanding people and why they do what they do. Using the data provided by our technology, people have a road map to accelerate teamwork."

The four-colored diagram seems more of a creative gimmick than anything based in science ("Look, that green rectangle represents my motivation to control things!").

All that sounds great (if a bit vague), but is there any substance behind the buzzwords and corporatespeak? There are a few impressed clients; the program is endorsed by Steven Sample, president of the University of Southern California: "Personalysis is a valuable tool that we have used in a variety of situations here at the University of Southern California. In 2000 we used Personalysis to help our five senior vice presidents and me better understand each other and form a more effective administrative team."

According to information provided by the Personalysis Corporation, the company was founded in 1975 by James R. Noland, who has "graduate degrees from Yale University and New York University [and] also worked with the New York Institute for Psychological Research." He developed the program based largely on ideas of Sigmund Freud, Carl Jung, and Abraham Maslow. From questionnaire responses, the program gives advice on communication, cooperation, expectations, and other measures important to the business world. One

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distinctive feature of the Personalysis report is the Colorgraph, a visual representation of personality traits that somewhat resembles the artwork of Piet Mondrian (see Figure 1).

A close review of Mr. Vande Voorde's "Personalysis Summary" reveals information that seems very much like astrology in that it depends on the "Barnum Effect" (using generalizations that seem specific but apply to everyone) to provide the illusion of personal validity. It

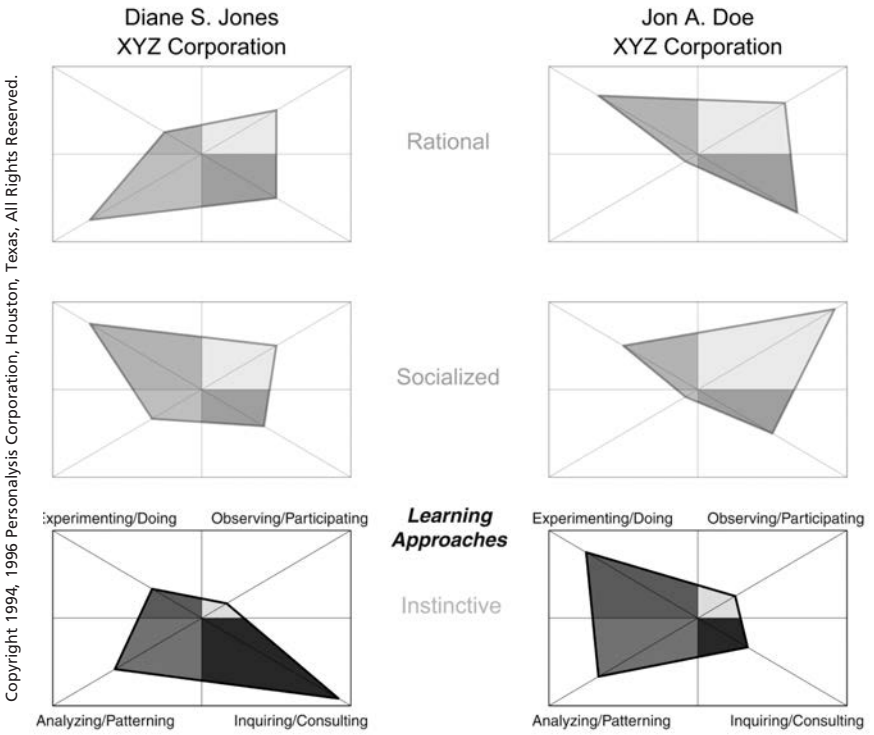

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Figure 1: A Personalysis chart (originally in color) supposedly representing an applicant's personality characteristics.

includes such comments as, "You need freedom to explore ideas and act," and "You are frustrated when having to deal with repetitious details or needless bureaucracy." This is of course in stark contrast to the rest of us, who don't need freedom to explore ideas, and who enjoy dealing with needless bureaucracy.

Though the Personalysis literature is heavy on testimonials, it is light on studies supporting its efficacy. The only published review I could find of Personalysis (Gebart-Eaglemont and Leung, 1995) is quite scathing, noting "there is no clear evidence that test items were generated in a systematic manner . . . test reports provide test takers with very specific comments about who they are, [yet] the empirical foundation of these specific comments is quite weak. There is no information on how items were developed, and how these items were written to reflect theoretical constructs upon which the test was anchored. Also, there is no information on whether a scientific process was involved in selecting test items, [and] no information given on the characteristics of norms. The technical manual was not comprehensive and informative . . . the sections on reliability and validity were not written in a clear and concise manner."

In other words, it's not clear how Mr. Noland developed his "scientific management tool that provides a unique assessment" of one's personality. It may have been created using cutting-edge behavioral science research. Or Noland may have just dreamed it up over a bottle of wine. Either way, it's a money-maker. The Basic Personalysis workshop costs $6,000, and advanced training is available for $3,000 more. For $400 per hour, you can consult with a Personalysis consultant via Web-based videoconferencing.

The basis for Mr. Noland's expertise is unclear. Curiously, the "New York Institute for Psychological Research" where Noland claimed to have worked doesn't seem to exist, and when I contacted the Personalysis Corporation inquiring about Mr. Noland, no one there could provide any further information on his academic background, including the years he allegedly graduated from Yale and NYU. Noland has long since retired and is no longer with the company. A search of the medical literature turned up nothing published by Noland since the 1960s, and little or nothing on the topic of behavioral science, despite the fact that Noland is cited as a "behavioral scientist."

As for the signature Colorgraph that is supposedly a visual representation of personality, the reviewers noted, "It is not clear why colors, instead of descriptors that might convey meanings, are used to denote personality traits." The four-colored diagram seems more of a creative gimmick than anything based in science ("Look, that green rectangle represents my motivation to control things!").

The review concludes, "From a scientific perspective, Personalysis is not developed through a vigorous and systematic research process. As this point, there is not sufficient empirical evidence to support the reliability and validity of Personalysis. Test takers should use it cautiously and with reservations." □

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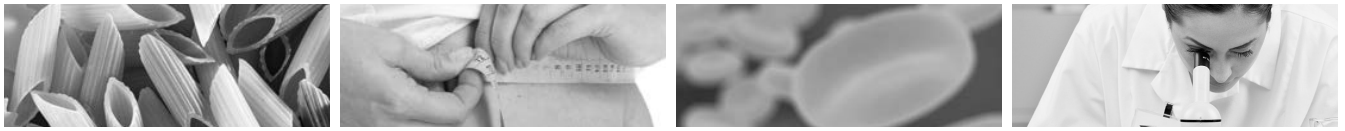

Science and Pseudoscience in Adult Nutrition Research and Practice

Human nutrition research and practice is plagued by pseudoscience and unsupported opinions. A scientific analysis separates reliable nutrition facts from nutritional pseudoscience and false opinion.

REYNOLD SPECTOR

In recent years, nutrition research and practice have lagged behind many other biological and medical fields.[1–5] In part, this lag is due to many pseudoscientific beliefs and practices mistakenly regarded as being based on scientific methods.[1–5] By nutrition I mean all the foods, fluids, and "natural" supplements humans ingest.[1, 2] By pseudoscience, I mean the use of inappropriate methods that frequently yield wrong or misleading answers for the type of question asked. In nutrition research, such methods also often misuse statistical evaluations.[4] My purpose here is to definitively (wherever possible) or tentatively (where the data are incomplete or nonexistent) answer a series of key questions about adult human nutrition using relevant rigorous scientific principles

and methods. The data clearly show that much current advice about dietary pyramids, food supplements, megavitamins, and weight loss regimens is frequently unproven, erroneous, or even harmful and is often based on pseudoscience or derivative incorrect professorial opinion.[1–7]

But before coming to the answers, we should frame the general questions precisely:

1. What do we know about adult human nutrition that meets the standards for truth?
2. Is there an optimum body weight? Is the ancient wisdom of Aristotle correct? He preached a sound mind in a sound body and, most importantly, moderation in all things, including diet. Or are current (immoderate) claims that large amounts of certain nutrients (e.g., vitamins, lycopene, fruits, and vegetables) and avoidance of others (e.g., saturated fats like butter, rapidly absorbed carbohydrates like rice and potatoes) the "way" to prevent bodily harm and promote health?[1, 2, 6, 7]
3. Why are there so many confusing or contradictory data and opinions in the literature, news media, and books on the following points?[1–5]
   - Are food supplements such as megavitamins—defined as greater than five times the recommended daily allowance (RDA)—helpful? Specifically, are megavitamins E, C, and carotene healthful or harmful? That is, will they prevent disease and aging alone or in combination? Is there even one supplemental nutrient (nutraceutical) proven to prevent disease and possibly prolong life?
   - Are certain common foods (in moderation) harmful? For example, are dietary saturated fats really harmful? Or are such fats useful fuel burned in the body to harmless carbon dioxide and water to provide energy as described in the biochemistry textbooks? Are processed rice and potatoes really bad for you? Do rice and potatoes really strain insulin production by the pancreas and lead to diabetes as alleged?[6] Or are rice and potatoes a reasonable source of calories ingested by billions without harm? In other words, are there some nutrients that can cause disease and others that can prevent disease and illness?[1, 2, 6] Are there "fountain of youth" nutritional approaches or do the body's homeostatic mechanisms counteract "over consumption" or "under-consumption" of most nutrients? Obviously, everything can be harmful in excess, even salt and water.
   - Are there comparative studies that show that certain classes of foods are better or worse than others for adult human health? Are diets high in saturated fats worse than diets high in rapidly absorbed carbohydrates or animal proteins?
   - Which weight-loss diets, if any, *work*?
4. Why are there so many erroneous or uninterpretable nutritional experiments (pseudoscience) in the literature? Why do so many scientifically contradicted claims persist in the literature?[3–5, 7] Why are certain long-term epidemiology/observation studies (EOS) continued in spite of the persistent publication of pseudoscience from these studies?[1–5, 7]

To answer these four general questions, we need to understand the methods required to prove hypotheses conclusively in human nutrition and human health. We must apprehend the assumptions, methods to establish causality, clinical trial design, hierarchies of evidence, and statistical concepts so we can evaluate nutritional studies correctly,[3–5, 8] i.e., to separate pseudoscience from science, falsehood from truth. Also, we need to understand the methods involved in extrapolating data from nutritional studies to inferences about populations. For example, data in children or young adults may not be transferable to the elderly (e.g., milk tolerance and vitamin B-12 absorption are different in children than in the elderly).

Finally, we must understand what the U.S. Food and Drug Administration (FDA) and other regulators require for assessing and approving nutritional claims and drugs.[3–5, 8] Within the limits of its jurisdiction (see below), the FDA generally evaluates claims of the type "X causes Y" based on rigorous scientific standards before accepting a causal claim.[1–4, 8] This is in contrast to many journal editors, academic and governmental nutritional committees (e.g., the Department of Agriculture), and the media, which often have weak scientific standards.[1, 2] I will briefly review the FDA standards below.

With a rigorous scientific approach, we can then distinguish "true" nutritional claims with some certainty—separate facts and reasonable inferences from false claims and unproven hypotheses where there is inadequate, incorrect, or misinterpreted data.

In an accompanying document entitled "Methodological and Statistical Issues in Adult Nutritional Research," available on the SKEPTICAL INQUIRER Web site, I describe in some detail the relevant methodological and statistical issues. This analysis is critical to understanding the results of much nutritional research, and I recommend it to interested readers. For example, many EOS widely used to assess causality (e.g., that megavitamin E decreases cardiovascular risk) are methodologically unable to do so.[4, 5, 7] Yet they are frequently performed and published. I explain this strange phenomenon and other methodologically important issues in the "Methodological and Statistical Issues . . ." document.

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What Do We Know?

In fact, we know a lot about adult human nutrition. As shown in Table 1, there are a number of nutrients and minerals humans must ingest for health and well being throughout life. For most adults, except as noted below, these nutrients and minerals are readily obtained from a balanced diet without the need for supplements.[9] Lack of these will lead to poor health and even death. However, it is true that in four- to six-week experiments in obese subjects, only water, vitamins, and minerals, especially potassium chloride, were required. In fact, very

obese patients can survive in excellent health for many months on only water, vitamins (in RDA doses), and potassium chloride.[1] Potassium is required to make up for its obligatory loss through the kidney. In these starving, obese people, calories are mainly obtained through fat mobilization with attendant weight loss. But over the long term, the nutrients and minerals in Table 1 must be ingested. As noted in Table 1, however, the need for calories (fuel) can mainly come from carbohydrate, fat, protein, or combinations of these three. The need for the essential substances in Table 1 is not controversial.[1, 6, 9]

Table 2 shows three important principles of biochemical and physiological nutrition. First, a healthy person (given RDA intake of the substances in Table 1) can proceed with a normal (see below), stable weight by eating predominantly fat or carbohydrates or protein or various combinations of these because of the body's ability to interconvert and utilize carbohydrates, fats, and proteins (amino acids) as needed. In other words, fat, carbohydrate, or protein can serve as the principal source of calories.

Second, the body has a remarkable ability to maintain relatively constant blood levels (homeostasis) of many nutrients. Even more remarkable is the ability of the central nervous system, testicles, and ovaries to maintain nutrient homeostasis. For example, in two carefully studied cases, even huge fluctuations in (orally) ingested potassium or vitamin C barely changed the concentrations of these substances in cerebrospinal fluid (CSF) or the brain.[10] We now understand the biochemical, molecular, and genetic bases for such remarkable homeostasis in the CSF and brain.[10,11] This has profound implications for attempting to prevent cognitive decline with certain nutrients as discussed below.

Finally, with aging, there are large changes in nutritional needs and metabolism. For example, there is approximately a 1 percent decrease per year in energy requirements after age thirty. As we age, there are also major changes in many functions in some individuals, for example, decreases in the enzyme lactase (in the gastrointestinal tract), which splits lactose to easily absorbed galactose and glucose. Also, in some elderly persons, the ability to absorb certain essential substances, such as vitamin B-12, declines. These changes must be understood when talking about diets in the young versus in the elderly.

Table 1. Examples of Essential Substances for which Recommended Daily Allowances (RDA) are Known*[1, 6, 9]

1. "Calories" for fuel from carbohydrate, fat and/or protein (see text)**
2. Vitamins (water- and fat-soluble)
3. Minerals (e.g., potassium, magnesium, calcium, zinc, salt, trace metals)
4. Essential amino acids
5. Essential fatty acids
6. High-quality protein (animal or vegetable, e.g., amaranth)

*Many Nobel Prizes were awarded for the work done in this table, especially for the vitamin work.
**The number of calories for each individual should be sufficient to maintain a steady weight with a BMI between 20–25.

Table 2. Examples of Important Principles of Biochemical and Physiological Nutrition

1. Inter-conversion in the body of carbohydrates, fats, and proteins as necessary
2. Homeostasis of vitamins, minerals, amino acids, sugars, and fats
3. Change in some functions with age, e.g., slowing of metabolism

Is There an Optimum Weight for Adult Humans?

The answer is probably yes.[12] There is a large amount of epidemiological, pathological, and clinical data that suggests a body mass index (BMI) (defined as weight in kilograms divided by the square of height in meters) of approximately 20–25 is optimal. A BMI of greater than 30 is termed obese. There is also a large body of controlled evidence showing that animals fed a low-calorie diet (that keeps them "thin") live longer and are healthier than heavier animals fed an "ad libitum" diet. These human and animal data satisfy Hill's criteria noted

in the "Methodological and Statistical Issues" document.[2–4, 12] However, in humans there has never been a randomized controlled trial of food intake to keep BMI at 20–25 versus greater than 30 with morbidity (disease) and mortality the end points.[12] But, for this article, I accept the notion that obese humans, on average, are less healthy and/or die sooner than people with a BMI of 20–25, all other things being equal, although it is formally possible that obese individuals are "doomed" for reasons independent of obesity.

Table 3. Erroneous Epidemiology/ Observation Studies (EOS)[2-5, 7, 9, 13–21]

EOS	Clinical trial results
1. Agents claimed to reduce cardiovascular risk	
a) Hormone replacement therapy	False
b) Reduce blood homocysteine with B vitamins	False
c) Low fat diets	False
d) Megavitamin E	False
e) Omega-3 fat supplements	Uncertain [21]
2. Agents claimed to prevent cognitive decline	
a) Megavitamin E	False
b) Megavitamin C	False
c) High dose b-carotene	False
d) Vitamin A	False
e) Various combinations of a, b, c, and d	False
3. Agents claimed to prevent cancer	
a) Omega-3 fat supplements	False
b) Dietary Fiber (bowel cancer)	False*
c) Lycopene and Megavitamin E (prostate cancer)	Probably false**
d) Folic acid (bowel cancer)	False

*Dietary fiber does, however, improve bowel function in some people and may be useful functionally.
**Based on best available data[16, 24]

Controversial Questions Answered

Are food supplements helpful? Are there particular nutrients that will prevent illness and disease and possibly prolong life?

The answer, notwithstanding thousands of positive EOS and, in some cases, small inadequate clinical trials, is there is no rigorous scientific evidence for the utility of dietary supplements, including megavitamins in normal-weight (nonpregnant) adults with a stable BMI of 20–25 eating a diet containing adequate amounts of the nutrients in Table 1. See Table 3 for representative examples of false claims based on erroneous EOS.[2–5, 9, 13–21] As you can see, the EOS have been frequently in error, yielding false-positive results. In general the clinical trials in Table 3 are examples of controlled, randomized studies done with very large numbers of people often versus placebo. (It is true, however, that in certain populations the RDA of a few vitamins might be slightly higher than in normal adults, e.g., vitamin D and possibly calcium for nursing home residents and others who do not go out in the sun, and vitamin B-12 for elderly people or for those on proton pump inhibitor drugs.) In fact, there is some evidence in controlled trials that megavitamins (e.g., E, C, and A) may actually increase mortality.[14] Clear exceptions to the general lack of utility of megavitamins are extremely rare patients with genetic abnormalities, e.g., those with vitamin B_6-responsive seizures.[10,11] Yet, notwithstanding the lack of evidence of benefit and potential harm, megavitamins and supplements are still recommended by some nutrition "experts."[9] It is worth noting that the nutraceutical (supplement) industry is a multibillion-dollar enterprise.[9, 14] Dan Hurley summarizes the pseudoscience in this area in his excellent book *Natural Causes*.[9]

Focusing on the lack of scientific rationale for so many nutritional claims, many people ask why and how this sad state of affairs developed. For example, based on what has been known for over thirty years about brain and CSF vitamin homeostasis, how could so many EOS investigators hypothesize and then accept EOS (Table 3) that suggested that megavitamin E, C, and/or B could prevent cognitive decline in adults on diets adequate in the essential substances in Table 1?[10, 11] Consumers and the public correctly ask: If you can't increase brain levels of these vitamins by even large oral doses, how could they "work?" The Hill criterion for biological plausibility is clearly negative.[3–5] In fact, after spending hundreds of millions of dollars on scientific controlled trials, it is now clear that megavitamins do not work (Table 3).

What then is the reason for so many erroneous EOS? Is there a systematic bias? First, as discussed in the "Methodological and Statistical Issues" document, because they are not randomized, EOS are prone to bias and confounding. In many studies, one type of bias is healthy-person bias. In other words, healthier, more health-conscious people tend to take supplements. These people tend to have less disease regardless of the supplements. So, in such EOS it looks like the supplements help. If randomized studies had been conducted, this would not happen (Table 3).

Are certain foods, minerals, or supplements harmful?

Excess amounts of anything can be harmful. Especially noteworthy are vitamins A and D, which can be very toxic in high doses. Aristotle was generally correct—all things should be in "moderation." He actually took this advice from an inscription on the temple of Apollo in Delphi, Greece. As I noted earlier, even widely used supplements such as vitamins E, C, and carotene in "standard mega-doses" (greater than five times the RDA) may indeed be harmful.[14] The potential for harm for many other types of supplements has not been systematically studied, although there are convincing data that certain supplements may damage the liver, kidney, or heart or alter drug metabolism.[9] For example, the amino acid tryptophan (used to induce sleep) and ephedrine-containing herbs (for asthma) were removed from the over-the-counter market because of severe toxicity, including deaths in some people.[9] Unfortunately, the FDA does not generally evaluate supplement claims for safety and efficacy nor does not it regulate the content of most supplements.[9] Hence, it is difficult to know the true content of these supplements. Moreover, when carefully measured, there are many examples of supplement labels not reflecting the true content, a deplorable situation.[9]

Are certain classes of foods better or worse than others?

In healthy people who ingest the essential nutrients in Table 1 and have a normal stable weight (BMI approximately 20–25), there is no convincing comparative outcome evidence (as I defined above) that common foodstuffs, e.g., saturated fats like butter, rapidly absorbed carbohydrates like white rice and potatoes, or animal proteins, are especially helpful or harmful. The notion that some diets (e.g., low-fat or low-carbohydrate) are better than others is not based on sound science but instead on flawed EOS.[1] The USDA food pyramid of the past (which prescribed what you should eat, how many portions, and disparaged certain nutritious foods like eggs and butter) was unscientific.[1, 2, 6] That food pyramid was based, in part, on EOS so flawed as to be almost ludicrous.[1, 2] Specifically, there are no scientific outcome data (as defined above) that five daily servings of fruits or vegetables as per the original USDA food pyramid are better than two or that apples are better than pears (notwithstanding Ben Franklin) in normal-weight adults who consume the essential nutrients in Table 1. Let the proponents of such dietary advice prove the value of their advice with real outcome data from well-managed randomized controlled trials. Similarly, recent attempts to create new food pyramids are also flawed, for example, those that disparage rapidly absorbed carbohydrates (e.g., processed rice and potatoes) and recommend megavitamin E.[6] Let the anti-potato and anti-rice proponents scientifically prove to billions of normal-weight adults or millions of older citizens with delayed gastric emptying (on diets adequate in the essential nutrients in Table 1) that potatoes or white rice per se are more harmful than whole wheat in scientific controlled outcome trials.

However, in obese individuals (BMI > 30), there is some evidence that not only do they eat too many calories but they may also be eating a diet (e.g., rapidly absorbed carbohydrates) that does not "satiate" them and leads to more rapid fat deposition.[1] This hypothesis remains to be proven.

Do weight-loss diets in obese people work?

None work well. On average, over the long term, obese humans do not lose much weight on voluntary low-calorie diets of any kind. (There are of course a few obese individuals who have "self discipline" and can lose weight and keep the weight off. Their "secret" is obscure.) There is, however, some evidence that low-carbohydrate diets "work" best at least for periods up to one year,[22] but this has not been replicated in a two-year study.[22a] Notwithstanding thousands of weight-loss articles and books, there has been very little progress in this area outside of surgical intervention.

Why is so much erroneous and pseudoscientific nutrition research and commentary published? Why do contradicted claims persist in the literature?

While the methodology to approach the truth in nutrition research has been known for decades, it is often either not followed or scientific data are resisted.[1–5, 7, 9] In attempts to understand why this happens, sociologists often employ a balanced analysis. A useful part of such an analysis is the question: who benefits from a particular event or behavior?[4, 5, 7] To begin to answer that question, it is necessary first to review past publication policies of leading medical journals.

In 1994, in a revealing editorial, the editors of the *New England Journal of Medicine* (who have published many erroneous EOS), in an Apologia in response to highly critical newspaper articles, attempted to justify publication of many conflicting (EOS) dietary studies on vitamins as chemo-preventive agents and the whole issue of dietary advice (e.g., butter vs. margarine).[23] Unfortunately, the editors did not claim that the goal of research should be the search for truth using the best available methods.[2–5, 23] They did not acknowledge the hierarchy of evidence and the great value of well-conceived and executed experiments.[2–5, 23] The editors seemed unaware that a few clear, convincing, well-conducted trials, when widely disseminated and followed, can change the practice of nutrition and medicine definitively, unlike hundreds of inconclusive studies, especially EOS.[2–5, 7, 23]

Table 4. Who Benefits from Current Publication Policies?[5, 9]

Category	How They Benefit
1. Editors and journals	A high volume of reports maintains sales, interest, advertising revenue, and so on.
2. Academicians	It's easy to publish almost anything; certain types of studies (e.g., case-control studies) require much less effort and resources than controlled trials to yield a publication.
3. Nutraceutical and certain agricultural/commercial interests	Sale of some foods, nutraceuticals, and supplements increase (e.g., megavitamin E therapy).
4. Selected news media	Controversy based on poor medical science increases sales of papers, magazines, and so on.

Instead, the editors stated, "Thus, nearly every clinical research study would be seen as preliminary. . . . Doctors know that clinical research rarely advances in one giant leap; instead, it advances incrementally."[23] The editors did not blame themselves (and other editors) for publishing low-quality or uninterpretable papers. Instead, the editors blamed the media, which should "improve the way they interpret science." Angell and Kassirer then stated that "the public at large needs to become much more sophisticated about clinical research, particularly epidemiology" because "what medical journals publish is not received wisdom but rather working papers."[23]

Thus, they as journal editors placed the burden on the student, nutritionist, medical scientist, physician, public, and media to determine what is valid, important, and meaningful, sometimes with the help of editorials.[23] This is not a realistic expectation as can be seen in the chaotic state of nutritional research and practice.[1–5, 7, 9]

Who benefits from such an editorial policy so profoundly dissonant with the scientific and regulatory principles described earlier?[3–5] Table 4 provides a tentative analysis of who benefits from poor-quality nutritional research and why.[5] Table 5

reveals a similar tentative analysis of who is harmed and how.[5]

As I described earlier, unless proper studies are done (randomized, single variable, hypothesis-driven, with validated instruments and proper statistical analyses), the literature is doomed to potential, often-unknown bias and confounding.[4] Although it is difficult and expensive to do long-term adequate nutritional studies, it is possible, and scientific studies have been done with megavitamins (e.g., E, C, folate, carotene), certain diets, and supplements[9] with definitive results (Tables 1, 3).

In view of the nutritional chaos I have described, it is a sad commentary on American regulatory authority that the FDA does not have the authority to regulate nutraceutical content and claims except when egregious safety concerns become apparent.[9] Thus, the public is at the mercy of the media, journals, and company advertising (Tables 4, 5), which is often misleading—from the subtle to the outrageous. This unfortunate state of affairs has recently been expertly reviewed.[9]

Table 5. Who or What is Harmed by Current Publication Policies and How[5, 9]

Category	How?
1. Consumers and patients	They receive incorrect nutritional advice (e.g., concerning diet, vitamins) and fail to benefit from obtaining better therapy.
2. Physicians and nutritionists	Time is wasted sorting nutritional wheat from chaff in the literature.
3. Nutrition scientists	Incorrect research in the literature is misleading.
4. Societal resources	Money is wasted on research that cannot yield a definitive answer and on unnecessary or harmful advice.
5. Media	Reporting advice that ultimately requires revision or repudiation makes them appear foolish.
6. Ethical behavior	Scientists, journal editors, and funding authorities that support and/or perform and publish inadequate or incorrect research (because of employing inadequate methods) that affects behavior/nutritional practice are diminished by this practice, thereby setting poor examples for students/fellows.

Finally, untrue claims that certain nutrients and nutraceuticals reduce cardiovascular risk and prevent cognitive decline or cancer (Table 3) steer patients away from safe, proven treatments that are often cheap and generic.[3–5] For example, generic aspirin, ACE inhibitors, and statins have been unequivocally proven to decrease cardiovascular risk and death in selected populations.[3–5]

The issue of why there is such persistence of contradicted nutritional claims is discussed at length by J.P.A. Ioannidis's group using megavitamin E as an example.[7] They focus on "wish bias."[7] But the unwillingness of investigators who perform pseudoscientific studies to concede error and the role of commercial profit-driven interests cannot be underestimated.[3–5, 9] It is worth noting that Walter Willet of the Harvard School of Public Health was still recommending megavitamin E in 2005 (at ten times the RDA),[6] notwithstanding the overwhelming evidence that, if anything, megavitamin E is harmful.[9, 14]

In summary, the critics of nutritional research and practice suggest that much nutritional research and practice is, to paraphrase Thomas Hardy, science's laughingstock, for two reasons: much of the research, especially EOS, is pseudoscientific for the reasons I have discussed and second, many practitioners and commercial interests do not readily acknowledge the truth.[1–5, 7–9]

Conclusions and Recommendations

The value of following the scientific principles noted above is well established.[1–5, 7–9]

1. Readers of medical reports and journals should focus on studies that employ methods that test a hypothesis definitively. Readers should be skeptical of the results of EOS that test a contributory causal hypothesis and draw causal conclusions unless they satisfy the Hill criteria.[3–5] Such studies must be considered at best hypothesis-generating. Moreover, unless such studies have a clear "upfront" hypothesis and prespecified data analysis plan *and* are not the result of "data-dredging," they merit even less credence.[3–5]

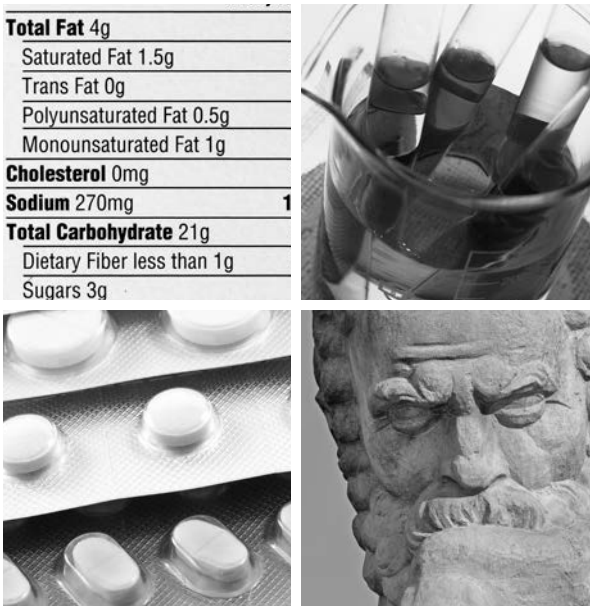
The editors did not blame themselves (and other editors) for publishing low-quality or uninterpretable papers. Instead, the editors blamed the media, which should "improve the way they interpret science."

2. Readers and viewers should encourage journals and the media to reform their publication and reporting standards. Journals should publish only scientifically sound studies and label most EOS as, at best, hypothesis-generating. Journals should have a section where authors who have published incorrect studies or nutritional advice can correct their views—analyze where they erred and discontinue defending erroneous and misleading publications.[7] Journals should carefully edit opinions on nutritional and therapeutic advice, rather than leaving such advice mainly to authors. The criteria for recommendations should include "substantial evidence" for efficacy and safety (as per the FDA) as well as chemically defined ingredients to avoid disasters like the tryptophan recall described earlier.[9]

3. Readers should encourage journal editors, academicians, and funding agencies to support quality studies (e.g., randomized controlled studies) rather than those unlikely to answer questions definitively (e.g., EOS, case-control studies, or cohort studies). Special recognition should be accorded investigators who do difficult but definitive studies.

In the end, as Socrates pointed out, the big question is: How should one live one's life? To decide, one needs good data! In terms of nutritional advice:

1. Demand scientific studies.
2. Follow the FDA criterion: only follow nutritional advice if *proven* to be safe and effective.
3. View the nutritional advice of "experts," like those who prepared the agriculture department's original food pyramid[1] and the newer food pyramids,[6] with a hypercritical eye. Their track record is poor.[1–5, 7, 9, 10]
4. Unless there is sound evidence, follow Aristotle's principles:



- Aim for a sound mind in a sound, stable body with a BMI between 20–25.
- Practice moderation in nutritional matters.
- Observe Table 1—especially elderly people and those on certain drugs (e.g., diuretics that can deplete the body of essential substances) or others (e.g., proton pump inhibitors that can interfere with nutrient absorption).
- Eat what works for you—especially as you age. For example, the elderly should often avoid lactose in milk products and should be careful to ingest enough vitamins and minerals, especially vitamins B-12 and D.
- In life, there are often special situations, such as early pregnancy, where special nutritional needs arise (e.g., folate). □

Acknowledgements

I wish to thank Michiko Spector for her help in preparation of this manuscript.

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Playing by the Rules

It is useless for skeptics to argue with someone who doesn't play by the rules of science and reason. If no amount of evidence will change your opponent's mind, you are wasting your breath.

HARRIET HALL

I recently read *Flock of Dodos: Behind Modern Creationism, Intelligent Design, and the Easter Bunny* (Barrett Brown and Jon P. Alston, Cambridge House Press, New York, 2007, no relation to the movie *Flock of Dodos*). It's a hilarious, no-holds-barred send-up of the lies and poor reasoning employed by the intelligent design movement. I was particularly struck by a quotation from William Dembski's book *Intelligent Design*: "We are dealing here with something more than a straightforward determination of scientific facts or confirmation of scientific theories. Rather we are dealing with competing world-views and incompatible metaphysical systems."

That doesn't just apply to intelligent design. It

cuts to the essence of what skeptics encounter on every front, from dowsing to homeopathy, from ESP to therapeutic touch. We are trying to evaluate the science behind claims that are often not based on science but on beliefs that are incompatible with science. The claimants are happy to use science when it supports them, but when it doesn't they are likely to unfairly critique the science or even to dismiss the entire scientific enterprise as a "materialistic worldview" or "closed-minded." We are talking at cross purposes. How can we communicate if we say "this variety of apple is red," and they insist "it feels green to me"?

We get frustrated when we show these folks the scientific evidence and they refuse to accept it. Dowsing fails all tests, but dowsers "know" from personal experience that it works for them. Homeopathy is not only implausible, but it has been tested and has failed the tests. Yet proponents refuse to acknowledge those failures and still want to talk about data from the nineteenth century and make claims for the memory of water. We have to realize we are not even speaking the same language. We are trying to play a civilized game of gin rummy, and they are dribbling a basketball all over the card table. Before competing, doesn't it make sense to define what game you're playing and what the rules are?

Before arguing with a mathematician about the solution to a geometry problem, it's essential to establish whether he is following the rules of Euclidean geometry, where parallel lines never cross, or non-Euclidean geometry, where they sometimes do.

Science has been a very successful self-correcting group endeavor. It wouldn't be successful if it didn't follow a strict set of rules designed to avoid errors. (Note: there are no rules written in stone; I'm talking about conventions that are generally understood and accepted by scientists, conventions that grow naturally out of reason and critical thinking.) If proponents of intelligent design or alternative medicine want to play the science game, they ought to play by the rules. If they won't play by the rules, they effectively take themselves out of the scientific arena and into the metaphysical arena. In that case, it is useless for us to talk to them about science.

If you want to play the science game, here's what you do:

1. Submit your hypothesis to proper testing. Testimonials, intuitions, personal experience, and "other ways of knowing" don't count.
2. See if you can falsify the hypothesis.
3. Try to rule out alternative explanations and confounding factors.
4. Report your findings in journal articles submitted to peer review.
5. Allow the scientific community to critique the published evidence and engage in dialogue and debate.
6. Withhold judgment until your results can be replicated elsewhere.
7. Respect the consensus of the majority of the scientific community as to whether your hypothesis is probably true or false (always allowing for revision based on further evidence).
8. Be willing to follow the evidence and admit you are wrong if that's what the evidence says.

If you want to play the science game, here are some of the things you *don't* do:

1. Accuse the entire scientific community of being wrong (unless you have compelling evidence, in which case you should argue for it in the scientific journals and at professional meetings, not in the media).
2. Design poor-quality experiments that are almost guaranteed to show your hypothesis is true whether it really is or not. Use science to show *that* your treatment works, not to ask *if* it works.
3. Keep using arguments that have been thoroughly discredited. (The intelligent design folks are still claiming the eye could not have evolved because it is irreducibly complex; homeopaths are still claiming homeopathy cured more patients than conventional medicine during nineteenth-century epidemics).
4. Write books for the general public to promote your thesis—as if public opinion could influence science!
5. Form an activist organization to promote your beliefs.
6. Step outside the scientific paradigm and appeal to intuition and belief.
7. Mention the persecution of Galileo and compare yourself to him.
8. Invent a conspiracy theory (Big Pharma is suppressing the truth!).
9. Claim to be a lone genius who knows more than all scientists put together.
10. Offer a treatment to the public after only the most preliminary studies have been conducted.
11. Set up a Web site to sell products that are not backed by good evidence.
12. Refuse to admit when your hypothesis is proven wrong.

Changing Our Minds

Scientists *will* change their minds when the evidence warrants. Before we waste time arguing, one thing we can do is ask our opponents what it would take to change their minds. One woman I asked said no amount of evidence could change her mind because she knew from personal experience that her claim was true, so any evidence that said otherwise would have to be false and fabricated. End of discussion. She's out of the game.

The rules of science are pretty clear about what it takes to change our minds. I'll use the example of *Helicobacter* and ulcers. We used to think that stress and too much stomach acid caused ulcers; now we think a bacterium causes ulcers. Here's a summary of why we changed our minds:

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1. Scientists noticed bacteria in biopsy samples from ulcers.
2. They identified the bacteria as *Helicobacter pylori*.
3. They found a strong correlation between ulcers and the presence of the bacteria.
4. One of the researchers, who was healthy and not a *Helicobacter* carrier, was able to induce an ulcer in himself by ingesting the bacteria.
5. They found that treating patients with antibiotics cured ulcers.
6. They found that antibiotics were superior to previous ulcer treatments.
7. The studies were replicated and conducted in different ways that corroborated each other.
8. The bacterial hypothesis was not inconsistent with the rest of scientific knowledge.

If we had the same quantity and quality of evidence for homeopathy, we'd gladly accept it. In fact, if the evidence met criteria 1 through 7, we'd provisionally accept it while we kept checking the data and tried like crazy to figure out the mechanism behind homeopathy. (For more on this, see "Bacteria, Ulcers, and Ostracism" in the November/December 2004 SKEPTICAL INQUIRER.)

We are trying to play a civilized game of gin rummy, and they are dribbling a basketball all over the card table. Before competing, doesn't it make sense to define what game you're playing and what the rules are?

There are two issues that are often misunderstood: scientific consensus and prior plausibility.

Prior Plausibility

Homeopathy is completely implausible. We would have to accept robust evidence that it worked, but we would require much stronger evidence than we would for, say, a new antibiotic. If the claims for homeopathy were true, we would have to revise much of what we know about physics, chemistry, and physiology.

The crossword analogy is helpful. If you think the answer to 1-across should be "library" but the clue to 1-down is a five-letter word for the author of *Tom Sawyer* and the clue to 2-down is a four-letter-word for the name of Eve's husband in Genesis, you have to reject "library" and keep looking for a word that starts with T-A. You have to recognize that no matter how strong your conviction that 1-across must be "library," you must be wrong and there must be another answer that you just haven't considered.

Consensus

It's easy to dismiss the scientific consensus as a popularity contest, a vote on opinions. But it's far more than that. The body of evidence stands or falls on its own merits, and when the weight clearly tips the balance to one side, everybody can see it. The scientific community is made up of experts who know how to evaluate the evidence and who thrash out disagreements in medical journals and scientific conferences. It is easy for the scientific community to reach an agreement based on clear evidence. There are times when the evidence is less clear and controversy among scientists is appropriate, but there comes a time when it would be perverse not to accept the evidence, just as it is perverse to deny evolution or germ theory. The scientific consensus on evolution and the germ theory is a recognition of reality, not a matter of opinion.

A reasonable default assumption is that the scientific consensus is usually right; if it isn't, it will change as the evidence becomes clearer. Truth will prevail. It does no good to attack the scientific consensus as prejudiced or closed-minded. The consensus will change only when it incorporates new and better evidence. One of the irrational tactics we've seen over and over is for opponents to cite one or a handful of studies to support their belief. They ridiculously assume that it was new information that the people who reached the scientific consensus had failed to consider or that it somehow outweighs all the other studies that found the opposite to be true.

Play by the Rules or Go Play Your Own Game

There's no point in arguing scientific facts with someone whose worldview is metaphysical and nonscientific. There's no point in presenting geological age data to someone who "knows" the age of the Earth from the Bible. Before we get into a useless debate, maybe we should find out what game our opponents are really playing. If they are playing ping pong, it's silly for us to bring a football to the table. It would be handy if we could get them to say up front what game they are really playing, but all too often they have deluded themselves into truly believing they are following the rules of science.

If they won't play the science game by the rules, we are justified in crying "foul" and disqualifying them. Then they can go away somewhere else and play their own game by whatever rules they want, and we won't be able to refute them. If they are relying on beliefs unsupported by evidence, let them say so. Wouldn't it be refreshing to hear a homeopath say, "I believe homeopathy works based on my personal experience and on nonscientific evidence like testimonials, and I categorically reject the results of any scientific trial that fails to support my beliefs. Homeopathy cured my neighbor's uncle's cousin of cancer. Trust me. I'm a nice guy so you should believe whatever I tell you."

If they'd say that up front, we wouldn't waste any of our valuable time rehashing scientific evidence that they will just ignore. They would be out of the game, permanently. And patients would have a better basis for giving truly informed consent. □

Ghosts, Doughnuts, and *A Christmas Carol*

Investigating New Mexico's 'Haunted' KiMo Theater

A careful investigation into one of the most famous haunted theaters in the Southwest reveals much about how ghost stories get started—and are perpetuated.

BENJAMIN RADFORD

The KiMo Theater in downtown Albuquerque, New Mexico, is a remarkable building. Built in 1926, it has a unique architecture that combines Art Deco style with Native American motifs, creating one of the state's most famous landmarks. The KiMo is also the best-known "haunted" theater in New Mexico, if not the entire Southwest.

The ghost said to reside therein, that of a six-year-old boy, has been the subject of dozens of newspaper and magazine articles, book chapters, and even a few investigations by local ghost hunter groups. It's a rare Halloween in Albuquerque when one or more news outlets doesn't carry some mention of the KiMo ghost. For such a public and well-known ghost story, it had received very little skeptical scrutiny until 2007,

when I decided to look into the case, joined by Albuquerque writer Mike Smith.

The story of the KiMo ghost begins with a tragedy on August 2, 1951. About a thousand people were in the theater to see an Abbott and Costello film when a water heater exploded into the lobby. When the dust and chaos had settled, eight people lay fallen; most seriously injured was Robert (Bobby) Darnall Jr., a six-year-old who died from his wounds. Bobby was laid to rest, and life went on after the KiMo soon reopened. No one thought much more about Bobby or the explosion until a few decades later—when Bobby returned from the grave.

Bobby's Return

Bobby Darnall returned in a most spectacular fashion. As the KiMo's longtime technical manager, Dennis Potter, described, "It was just before Christmas, and the New Mexico Repertory Theater Company did *A Christmas Carol*." The director, Andrew Shea, noticed some doughnuts strung up against the brick wall at the back of the stage, supposedly left as an offering to the ghost. Shea ordered them removed, thus angering Bobby's ghost.

Potter, who worked the production and was there that night, says that "about ten or fifteen minutes into the show, weird things started going wrong. People were forgetting their lines, people were tripping and falling on stage, odd pieces of equipment would fall from the ceiling, light bulbs exploded. Electrical cables fell down . . . light gels came off and fluttered down during dramatic moments. . . . Windows and doors on the set were either not opening, or were opening when they weren't supposed to. It was just really weird. They almost literally didn't get through the show, there were so many disruptions."

Finally the show ended. According to Potter, the director replaced the doughnuts to appease Bobby and the next show went off without a hitch. From then on, doughnuts were left for Bobby as an offering for a successful show; some years ago they were moved to a small shrine near the dressing rooms. These days, for health reasons, the doughnuts have been replaced by a collection of other offerings for the boy ghost, ranging from toys to theater tickets to ballerina shoes.

One dictum of skeptical investigation is "The devil is in the details." In this case, the ghost—or lack thereof—is in the details.

According to several sources (including Garcez 1994), the doomed *Christmas Carol* production was held on December 25, 1974. Others claim that Bobby continues to haunt the KiMo

The KiMo Theater, in Albuquerque, New Mexico, is one of the best-known "haunted" places in the Southwest.

and has in fact ruined other performances since then. Writer Scott Johnson of the ghost-themed Web site DreadCentral.com claims, "For a period of time, it seemed that not one performance went off without some type of disaster. . . . Sightings of Bobby are continuous, year round" (Johnson 2007).

The story of the KiMo Theater has all the elements of a good ghost story, including the tragic death of a young boy and unexplained happenings. Yet all the reports—absent further investigation—are simply stories and anecdotes, not hard evidence.

There are a few people who claim to have found real evidence of Bobby's ghost in the KiMo. They are the Albuquerque ghost hunting group New Mexico Paranormal Investigations (NMPI). The NMPI team searched for evidence of Bobby or other spirits using electromagnetic field (EMF) detectors, dowsing rods, thermometers, and other equipment. During their investigation, they reported finding "anomalous EMF energy," a "wisp of energy," and so on, as well as taking photographs they claim are of Bobby's ghost.[1]

. . . But Is It True?

At first glance, and taken together, the evidence that Bobby Darnall haunts the KiMo Theater seems impressive. Hundreds of eyewitnesses seemingly saw unexplained phenomena during the ruined Christmas production; ghost experts confirmed the existence of something supernatural at the KiMo, complete with "anomalous" photos. But one dictum of skeptical investigation is "The devil is in the details." In this case, the ghost—or lack thereof—is in the details.

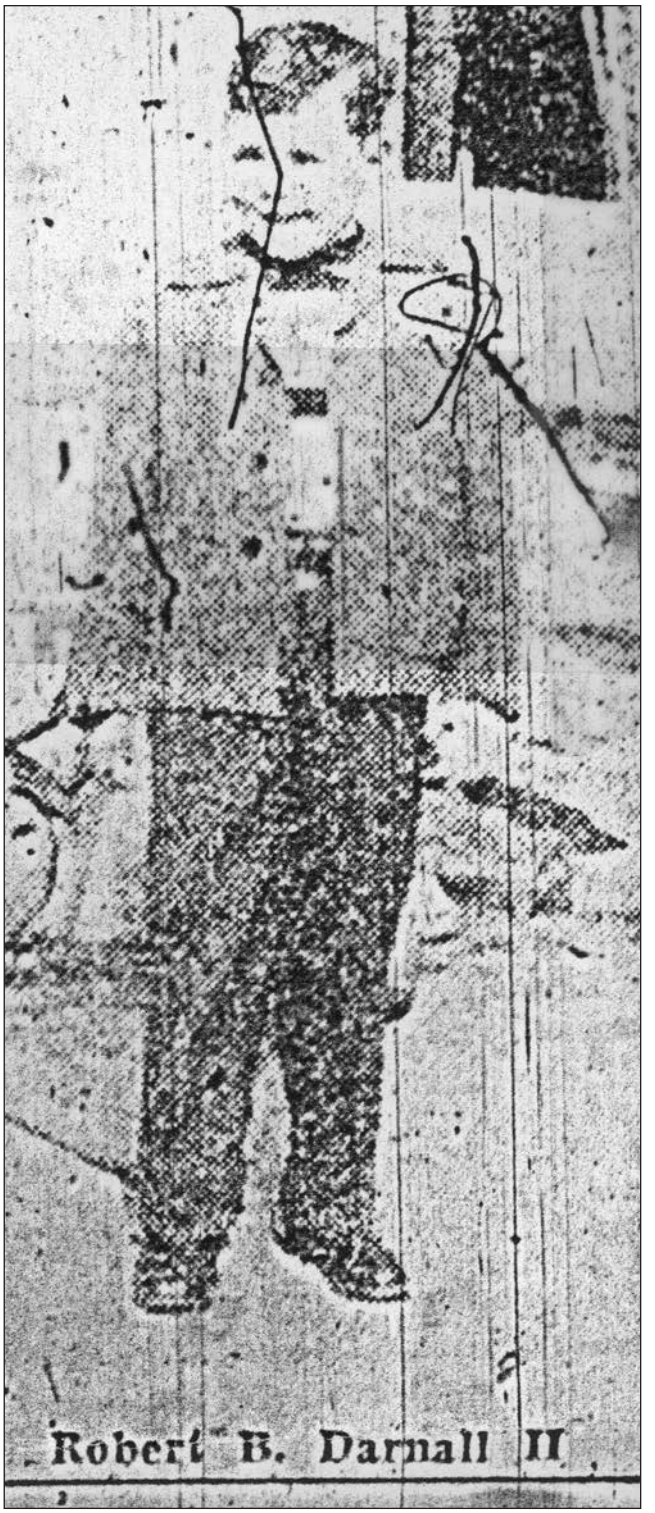
The account of the disastrous production is important in understanding the KiMo ghost story for several reasons. It is the first time that the ghost of Bobby Darnall was linked to mysterious occurrences at the KiMo. Perhaps more important, it is something tangible, something that can be verified. Most of the "evidence" for ghosts consists of odd feelings, ambiguous photos, and occasional sightings—things that can't really be examined or tested. But the unexplained phenomenon of exploding lights, mysterious falls, and objects moving on their own—witnessed by thousands of people on several occasions—is much closer to hard evidence.

Something—whether it was Bobby's ghost or some other mysterious force—ruined the production of *A Christmas Carol* on Christmas Day 1974.

Or did it?

The first step in unraveling a mystery is verifying the date. As it turns out, Bobby's ghost could not have ruined a play at the KiMo on Christmas Day 1974. A newspaper archive search revealed that the KiMo was an adult theater at that time, and patrons that day saw a pornographic film called *Teenage Fantasies*. If Bobby was present that day, the early '70s porn was probably more disturbing to the child ghost than the lack of doughnuts.

Potter dismissed the claims that there had been several ruined shows, saying there had only been one and that it was not in 1974 but instead in the late 1980s or early 1990s (his memory was hazy not only about the year but the decade).



This photo of Bobby Darnall was taken from the *Albuquerque Journal* coverage of the KiMo explosion.

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Today's Smile

ALBUQUERQUE JOURNAL

NEW MEXICO'S LEADING NEWSPAPER

Good Morning

71st Year — Friday Morning, August 3, 1951 — Published Every Morning — 36 Pages in Two Sections — Price 7c

Kimo Theater Blast Kills Boy

Allies Think Reds May Accept UN Cease-Fire Line

UN ADVANCE HEADQUARTERS, Korea, Friday, Aug. 3 (AP)—A high United Nations source expressed belief today the Reds might be preparing to accept the Allied stand on a Korean cease-fire line despite their vocal insistence on

State Dept. Aides Spied for Reds, Witness Testifies

Former Mrs. Euler Names Field, Duggan To Senate Group

WASHINGTON, Aug. 2 (AP)—Mrs. Hede Massing, a Viennese who said she worked in Wash-

Flood-Hit Rail Cars Held Here

SANTA FE, Aug. 2 (AP)—State health and pharmacy officials are inspecting 12 railroad cars of tomatoes, foods and drugs at the Albuquerque rail yards.

Dr. James Scott, state health director, and his department is inspecting the food and cosmetics, the state pharmacy board inspects the drugs.

The cars, Dr. Scott continued,

Truman Declares Eisenhower Free To Run in 1952

President Believes Duties in Europe Won't Bar General

WASHINGTON, Aug. 2 (AP)—President Truman said today he doesn't think Gen. Dwight D. Eisenhower's Du-

Others Are Injured When Water Heater Explodes in Lobby

This headline from the *Albuquerque Journal* details the 1951 explosion at the KiMo that killed young Bobby Darnall.

The shrine to Bobby's ghost is located backstage at the KiMo Theater.

With some detective work, Mike and I narrowed down the year to December 1986 and then contacted others involved with that production of *A Christmas Carol*. I spoke to Steve Schwartz, the actor who played Bob Cratchet. I asked him what he remembered about that fateful night.

"It went great, it was a wonderful performance," he said.

A wonderful performance? With all the unexplained problems? How could he have forgotten such an infamous event? I elaborated, hoping to jog his memory. "The story goes that there was a performance of *A Christmas Carol*—in fact it was one of the ones you played in—that was ruined by mysterious phenomena: the actors forgot their lines, there were exploding lights, missing props, and basically everything that could go wrong went wrong."

Schwartz replied, "That sounds like good copy, but I can't corroborate any of that. I don't remember any problems like that or any problems with the show."

I hung up the phone, trying to understand why the technical manager and the lead actor in the same play had two completely opposite memories of the show. Of course, people's memories change over time, and though Mr. Schwartz didn't recall problems with the play, someone else might.

To get a third eyewitness account, Mike contacted Andrew Shea, who directed the play and whose dismissive doughnut disposal allegedly led to the ruined performance. Shea spent eight years directing plays at the KiMo from 1984 to 1991. He also disputed Potter's recollection of the disaster: "I don't remember it being a disaster in any way," he said. Furthermore, according to Shea, the story of him taking down the doughnuts and then replacing them after the disastrous performance never happened. He also discredits other stories about ongoing strange occurrences at the KiMo due to Bobby or any other ghost: "There were no events during my eight years there that didn't have mundane explanations. . . . I don't recall anything supernatural or out of the ordinary happening."

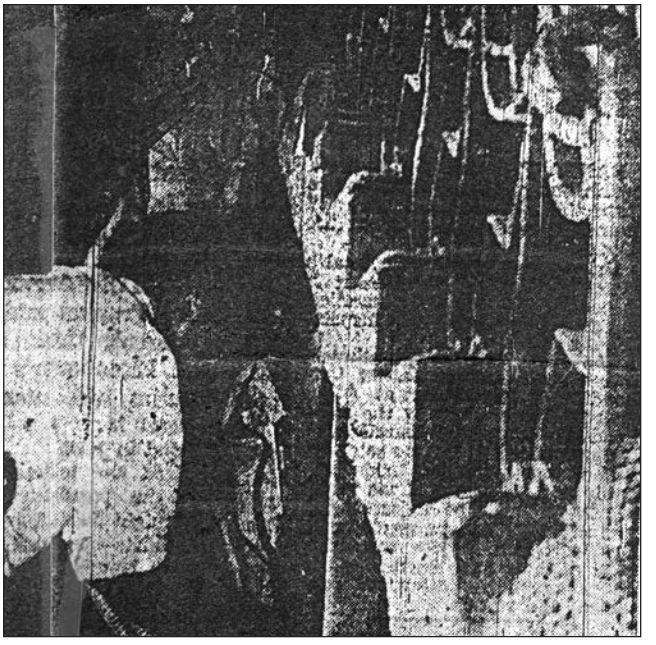
So the play's main actor and the director both discredit the ghost story, as did numerous others in the production. Dennis Potter is literally the only person who remembers the ruined play. A final nail in the coffin came from newspaper accounts of the play—or, more precisely, the lack thereof. We searched newspapers for reviews. Surely such a mysterious and infamously disastrous performance would have been noted at

least in passing in the *Albuquerque Journal* or the *Albuquerque Tribune*. The reviews were positive, and not one mentioned actors falling or tripping, exploding lights, or any ghostly activities. All the evidence points to one inescapable conclusion: The ruined play—the very genesis of the KiMo ghost story—simply did not occur; it is but folklore and fiction.

Spawning the Story

Where does this leave Dennis Potter and the countless ghost articles his tale spawned? Potter is not a liar nor is he crazy; he simply did something we all do from time to time: he misremembered. Decades of psychology studies show that human memory is remarkably fallible. The brain is not, as many suppose, a sort of tape recorder that accurately preserves what we experience. Instead, memories change over time. Until we are confronted with evidence to the contrary, we will continue to confidently believe our memories.

KiMo technical director Dennis Potter shows the author where the theater's boiler exploded.



A close inspection of photos and news accounts reveals that the stairwell and railing were intact and undamaged in the explosion.

Psychology helps explain how Potter's faulty memory could create a ghost story. But hundreds of sources, from Antonio Garcez to Albuquerque ghost hunters to local television reports and Web sites, repeated the story of Bobby and the doomed show. How could so many accounts have gotten it wrong? The simple answer is that Dennis Potter is the source of virtually all the information; the journalists, writers, and "investigators" repeated the stories, never bothering to independently verify his account.

One difficulty with information on the KiMo ghost (as with most paranormal topics) is the tendency for many writers on the subject to simply copy information from one source to another without checking any facts. The problems range from shockingly sloppy research to outright plagiarism.[2]

Ghostly Evidence

With some skeptical investigation, the story of Bobby Darnall's ghost collapses like a haunted house of cards. But an obvious question arises: What about the ghost hunters who claimed to find evidence of Bobby's ghost? What phenomena at the KiMo are they interpreting as evidence of the paranormal?

To answer this, some background on ghosts and ghost hunting is helpful. There is no evidence that ghosts exist, much less that the tools the ghost hunters use (dowsing rods, pendulums, electromagnetic field detectors, etc.) actually detect ghosts. Many ghost hunters seem unaware of this fact or willfully ignore it. As with the story of the doomed play, the "ghostly evidence" evaporates under a little critical thinking and close examination. Almost every part of the ghost hunters' investigation is scientifically invalid and/or factually wrong.

Aside from a few "anomalous readings," one of the NMPI's favorite pieces of evidence for ghosts is something called an orb. These are "unexplained" round or oval white shapes that appear in photos. There is not one blanket cause for all orbs; many things can create the phenomena, including insects, reflected flashes, and dust. Orbs may seem otherworldly because they appear only in photographs and are usually invisible to the naked eye. They are often unnoticed when the photo is taken; it is only later that the presence of a ghostly, unnatural, glowing object is discovered, sometimes appearing over or around an unsuspecting person. To those unaware of alternative explanations, it is no wonder that orbs will spook many people. (For more on orbs, see Radford 2007, Nickell 1994, and Biddle 2007).

The ghost hunters made another mistake. The NMPI Web site has a short write-up of their investigation, and one photograph shows an orb at the top of the KiMo's stairs; the caption reads, "Note orb at location of Bobby's death."

However, Bobby Darnall did not die on the stairs as the NMPI investigators claim. A close inspection of photos and news accounts reveals that the stairwell and railing were intact and undamaged in the explosion. According to a photo and caption on page 2 in the August 3, 1951, *Albuquerque Journal*, "Balcony stairs directly over the heaters were undamaged." Since the stairs above the heater were "undamaged," it's virtually impossible that Bobby was on the stairs (much less on the landing where the "ghost photo" was taken) when the explosion occurred. Had Bobby been on the stairs, the concrete stairs themselves would have shielded him from the blast underneath.

The ghost hunters are even wrong on a more basic point: not only didn't Bobby Darnall die on the staircase where his supposed ghost was photographed, he didn't even die at the KiMo theater! According to the August 2, 1951, *Albuquerque Journal*, Bobby Darnall was alive when he left the KiMo: "Police said the boy had a faint pulse when picked up in the theater lobby, but he was dead on arrival at St. Joseph's Hospital." So Bobby actually died in an ambulance somewhere on the streets of downtown Albuquerque.

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Instead of the KiMo's supposedly spiritually ruined performance of *A Christmas Carol*, this advertisement from the Christmas 1974 *Albuquerque Journal* shows that the venue was instead an adult theater.

Any credibility the ghost hunters may have had vanishes quickly under the mountain of basic errors, mistaken assumptions, and unchecked facts. Perhaps most troubling, ghost hunting organizations portray themselves as expert authorities on ghosts and the paranormal. They sell books, give lectures, and charge money for seminars, supposedly teaching clients how to conduct ghost investigations.

Just as Dennis Potter did not intentionally create the story of the KiMo ghost, the ghost hunters did not intentionally hoax or mislead anyone. Their "evidence" is simply a series of errors and mistaken assumptions. To be fair, the low level of science and investigation is actually typical for amateur ghost hunter groups. They are staffed by sincere people who have good intentions but a very poor understanding of investigation, research, or scientific methods.

When facts are checked and mistakes corrected, the inescapable conclusion is that there is simply no evidence of a ghost at the KiMo Theater. Ultimately, the KiMo ghost story is neither a lie nor a hoax—but nor is it true. Overactive imaginations, factual errors, and mistakes, combined with standard theater ghost lore and some misguided ghostbusters, created the KiMo ghost. The story was told and retold, hashed and rehashed, with each iteration adding or omitting details without anyone bothering to check the facts until finally a ghost was created.

The KiMo ghost has been the subject of local lore for at least a decade. While some may mourn the passing of a good ghost story, no harm can come from finding out the truth. In fact, the story of Bobby Darnall as the KiMo ghost has pestered and haunted the Darnall family for decades. His sister and brother feel exploited by the story and do not appreciate the fictional claims that their beloved brother is eating doughnuts or ruining performances at the KiMo Theater. Only when the KiMo story is repeated as fiction, not fact, can the memory of little Bobby Darnall truly rest. □

Notes

1. A full report can be found online at www.nmparanormal.com/kimo.htm.

2. To give just one example, ghost hunter Cody Polston, founder and president of the Southwest Ghost Hunters Association, heavily plagiarized a book chapter on the KiMo ghost. Compare pages 32 through 34 in Polston's 2004 book *Haunted New Mexico* with pages 116 and 117 in Ellen Robson and Dianne Halicki's 1999 book *Haunted Highway: The Spirits of Route 66*. The plagiarism is both rampant and unmistakable. With so many authors simply copying each other's work instead of doing any actual research, it's little wonder that errors are repeated and myths taken as fact.

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The Roots of Skepticism

Why Ancient Ideas Still Apply Today

Some of the central ideas of ancient skepticism have historical significance and still influence contemporary skeptical and scientific inquiry.

CHRISTOPHER DICARLO

A recent headline from the now-online-only *Weekly World News*[1] reads: "Alien Bible Translated: Extraterrestrials follow the teachings of Oprah Winfrey." Apparently, Oprah's popularity has now reached astronomical proportions. In another issue,[2] headlines read: "Scientists Reveal Lawyers and Leeches Have Identical Genetic Makeup." Now, as much as some of us would like to think this is true, we still might want to say something in defense of the leeches.

But seriously, when we ask whether or not anyone should believe these and other similar stories, we are assuming that there are better and worse ways to interpret and act on information. We often find these stories ridiculous because they cannot possibly correspond to what we experience in everyday life without giving rise

to a number of obvious contradictions and inconsistencies. Quite simply, they are inconsistent with the logical structure of our methods and means for explaining events in the world. And so we look upon them with a certain amount of reservation and disdain for their *epistemic irresponsibility*. We doubt their truth, and we believe we have good reason to doubt them. In other words, we are skeptical of them.

Although it is not difficult to be skeptical of the truth of such events, I believe it is important to ask ourselves what it means to be skeptical today, by tracing skepticism's rich ancestry. Once we have an understanding of the ancient roots of skepticism, we will see a clear and obvious path to the evolution of scientific reasoning—specifically, scientific methodology, criteria, power of explanation, and epistemic responsibility.

First of all, contrary to what many believe, the term *skeptic* does not mean "doubter." The Greek term *skeptikos* means "inquirer" or "investigator."[3] Originally, skepticism was referred to as Pyrrhonism—so named after its founder Pyrrho of Elis. When we look at the history of ancient skepticism, we can see three predominant periods: the pre-Academic (which flourished after the death of Alexander the Great in 323 BCE[4]), the Academic (which lasted into the second century CE), and the post-Academic (which flourished after the death of Christ, lasting into the third century CE).

The Pre-Academic Skeptics

On the western side of the Greek Peloponnesus in a city named Elis, the philosopher Pyrrho was born around 360 BCE. Like Socrates, Pyrrho never kept a systematic account of his philosophy in writing. Most of what we have of Pyrrho today comes from the writings of his star pupil, Timon. Instead of elaborating a complex written system, Pyrrho offered his followers an *agoge*—an exemplary way of living. Though not much is known about the specific lifestyle Pyrrho professed, we do know that it involved living peacefully according to the laws and customs of the state.

Although this might not seem a terribly radical lifestyle, to fully appreciate Pyrrho's contribution to skepticism and epistemic responsibility, we need to keep in mind that the central goal of much ancient Greek philosophy was happiness or *eudaimonia*. But this was no ordinary or base form of happiness. It involved a contentment of mind in the conduct of life. From Pyrrho's student Timon, we learn that if a person is to be happy, he must ask himself three questions and answer them to the best of his ability:

1) What is the stuff of things?

Pyrrho's response is that our five senses and all proposed metaphysical theories (such as those held by the Pre-Socratic philosophers) contradict each other when they refer to the nature or essence of things. For example, when we taste honey, is the sweetness in the honey or is it in us? Certain foods may smell sweet but have a bitter taste. An object may look smooth but in fact be quite rough to the touch. Our senses, then, contradict one another when we attempt to determine the nature of things. And so, too, do the metaphysical theories about the nature of all of reality. The prime component is air. Or is it water? Or motion? Or atoms? Etc.

2) In what relation do we stand to things around us?

When it comes to conflicting theories concerning the inner nature of things, Pyrrho suggests that we refrain from siding one way or the other because either is equally plausible or implausible. And so we must engage in *epoche*. *Epoche* is the suspension of assent or belief. It is the withholding of belief in the face of equally plausible or implausible claims regarding the true nature of things.

Like Socrates, Pyrrho explicitly recognized his own ignorance and acknowledged *akatalepsia*, or lack of absolute knowledge concerning reality. In light of this realization, Pyrrho assumed *aphasia*, or quietude concerning the absolute nature of things.[5] In other words, since one cannot determine one way or the other which metaphysical doctrines are true and which are false, one should choose neither and remain silent, for nothing true *can* be said concerning the nature of things. This did not mean, however, that a Pyrrhonian simply remained quiet regarding non-metaphysical issues. On the contrary, the skeptic was very interested and active in practical affairs.

3) What is the result, as far as our happiness is concerned, of this metaphysical detachment?

To Pyrrho, this detachment of belief (or *epoche*) led to a state of *ataraxia*, or tranquillity of the mind. By abstaining from fanaticism concerning matters that apparently cannot be proven, we can become content with living peacefully among our experiences without the desire to know the true nature of reality. Pyrrho's indifference was directed mainly at the dogmatic and fanatical views of philosophers. Rather than trying to shed or numb his ordinary human feelings, he exercised moderation in the face of the massive, unyielding forces of nature (like death and illness) that all humans must meet.[6] This notion of moderation comes from the Greek *metriopatheia*, which means that we can control our passions when confronted with natural forces beyond our control.

As an illustration of *metriopatheia*, consider a story about Pyrrho at sea during a very bad storm. While the passengers were cowering in fear, Pyrrho maintained a level of calm. When the storm seemed to be at its worst, Pyrrho pointed out to the passengers a small pig that was eating quite con-

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tentedly while the storm raged around it. It is the calmness of the pig, said Pyrrho, that signifies wisdom. Since the storm is a force of nature beyond one's control, it is senseless to let our fears get the best of us. Nothing can be done about it. For most of us, nature is sometimes too powerful and we have natural emotional responses to that power. Given our current understanding of our genetic, biological, and emotional influences, irrational responses to events beyond our control seem perfectly normal. However, the use of *metriopatheia* involves a conscious and rational understanding that human beings' responses will not affect the outcome of any natural occurrence beyond their control. In other words, wishing for something does not make it so. In fact, overly emotional human responses could worsen a situation by clouding our reasoning abilities. This does not mean we are going to act rationally in a desperate situation. On the contrary, some of the most level-headed people can become extremely irrational during times of crisis. So mastering something like *metriopatheia* requires considerable time and discipline. In times of crisis, it would be favorable to be cool-headed clear thinkers who act accordingly. It should come as no surprise, then, that a skeptic is always made and never born. It takes considerable time and discipline to recognize and accept one's ignorance and constraints regarding various aspects of the world and to use this information (or lack thereof) in a beneficial and practical way. This is not an easy thing to do. Think for a moment of how different things could be in the Middle East today if world leaders could accept and apply some of these central Pyrrhonian ideas.

The Academic Skeptics

After the death of Socrates, Plato began a school of philosophy in Athens called The Academy. In the third and second centuries BCE after Plato's death, The Academy became involved once again with skepticism. Academics who took over The Academy continued the tradition of doubt and inquiry made popular by Plato's predecessor, Socrates. Like both Socrates and Pyrrho, the Academics developed the distinction between the appearance of things or phenomena and the inner constitution of things. This distinction between appearance and reality became extremely important; it continued to emphasize separation between metaphysical matters—matters that could not be resolved by any rational or empirical means—and commonsense matters, matters that one must deal with on a day-to-day practical level. Notice how similar this is to the way in which modern science deals with information today; science is generally pragmatic—if it works and is communally agreeable, then it is provisionally warranted. Most scientists are not in the metaphysics business. The influence of this type of pragmatic attitude can be traced directly to the Pyrrhonians.

There are at least two very important elements that the Academic Skeptics introduced into skepticism:

1) The first involves consistent and systematic attacks directed toward specific dogmatic positions, like the metaphysics of Plato and the philosophy of the Stoics. The term *dogmatic* comes from the Greek *dogmatikos*, meaning doctrinaire thinker. A dogmatist is someone who holds *dogmata*—not merely casual beliefs but theoretical doctrines, tenets, or principles—to be true. The Academics would direct their attack at specific schools of thought while the pre-Academics were more concerned with living a peaceful, happy life.

2) The Academics also introduced a detailed doctrine for living among the phenomena of everyday life. They developed rules and a vocabulary for dealing and interacting with their experiences.

First of all, contrary to what many believe, the term *skeptic* does not mean "doubter." The Greek term *skeptikos* means "inquirer" or "investigator."

The first of the great Academic skeptics was Arcesilaus, who was born approximately 315 BCE and died around 240 BCE. He became head of Plato's Academy and immediately rejected Plato's metaphysical doctrines. Arcesilaus also focused his criticism on the Stoics. The Stoics believed that there were certain perceptions that are self-evidently true and that cannot be doubted.[7] The Stoics believed that these perceptions were so strong that they would force the mind to assent to them, and by so doing one could grasp the inner nature of things in the universe. But Arcesilaus maintained that knowledge of the inner nature of things is not possible without first determining absolute criteria by which to make such determinations. The problem of establishing a criterion or set of criteria from which we can justify metaphysical beliefs has been around for millennia. The problem has, to this day, centered on our conceptual and intellectual limitations for devising or discovering absolute criteria. Consider the following thought experiment involving gold in a dark room.

The Gold in the Dark Room Thought Experiment

This thought experiment involves a story in which various people find themselves in a totally dark room. They are told that there are various objects throughout the room made of different metals: iron, lead, steel, silver, bronze, brass, etc., but that only one object is made of gold. They are then asked to move around the room and pick up the various objects to determine when they have found the gold object. The analogy here is very simple. Positing metaphysical theories is like trying to find the golden object in the dark room. Even if we had the golden object in our hands, we would not know it because we lack the capability to make such discernment. We may believe metaphysical theories that are ultimately true. However, we have no way of knowing they are true because we lack the

criteria by which to make this discernment.

And so, just as Socrates maintained, the Pyrrhonians, too, stated that we must admit our ignorance on such matters. The great value of this realization and admission, of course, is that we are *humbled* by acknowledging that we are limited in our knowledge. Once we make this realization, we can better deal with matters that affect us more directly—such as commonsense practical affairs and, eventually, scientific investigations. Epistemic humility attained in this manner is a responsible starting point in the acquisition of information, and such humility is entirely egalitarian. Reflecting upon one's ignorance in a responsible manner applies to every human on this planet. It cuts through any and all barriers—naturally evolved or culturally created. This is not to say that such a realization means that metaphysical matters are not important. On the contrary, they can be extremely important. However, the *very important distinction* here is the conscious recognition and separation between metaphysical matters—the truth of which we currently cannot determine—and commonsense (and eventually, scientific) matters, the truth of which we can determine, at least in a tentative, communal, and practical way. Historically, I think one of the greatest legacies the ancient skeptics have given us is an understanding of the overall epistemic framework in which we attempt to understand the world and ourselves. It is a very mature and well conceptualized metaview of knowledge because it looks at what is involved in everyone's attempt to understand the world. I believe this is one of our species' greatest cultural and conceptual accomplishments—the separation of *BIG T* (metaphysical) Truth from *little t* (commonsense and scientific) truth.

As skeptics, we have an obligation to continue to establish universal rules of reasoning in an effort to hold people accountable not only for their beliefs through *epistemic responsibility* but, more importantly, for their actions that may be harmful to others.

The Post-Academic Skeptics

There are two post-Academic skeptics whose works we shall consider: Aenesidemus and Sextus Empiricus. Aenesidemus produced what are called the *tropoi*, or ten modes of skepticism, that put equally plausible beliefs in conflict with each other. These became powerful tools that very effectively allowed a skeptic to criticize any metaphysical doctrine. They ranged from the differences of perceptions between different species to the cultural differences that exist between humans.

> [When we] have established that all things are relative, we are plainly left with the conclusion that we shall not be able to state what is the nature of each of the objects in its own real purity, but only what nature it appears to possess in its relative character. Hence it follows that we must suspend judgment concerning the real nature of the objects. (Sextus Empiricus 1967, 83)

But the skeptics did not simply criticize the dogmatic views of others. They developed a means of dealing with day-to-day practical affairs.

The Practical Criterion

Arguably, the greatest of all works on ancient skepticism is Sextus Empiricus's *Outlines of Pyrrhonism*. According to Sextus, after the skeptic has doubted the legitimacy of the absolute truth of the many various metaphysical theories, one may rightly ask how the skeptic functions in day-to-day life. You would think that if the skeptic continues to doubt the very things that attempt to provide an understanding of the nature of his experiences, he would be left in a state of catatonia—that is, the skeptic would cease to move or to function in any society (and this is how some ancient historians, like Diogenes Laertius, have wrongly caricatured the ancient skeptics). But Pyrrhonian skeptics did manage to function within society—in fact, they functioned very well and in a contented manner. How did they achieve this? Very simply—the skeptic *acquiesces to the appearances*. The skeptic "goes along" with the appearances, neither affirming nor doubting the true nature of them. Sextus has listed four main aspects that aid the skeptic in acquiescing to the appearances. These four aspects have collectively been called the Practical Criterion:

1) *The guidance of nature*: the skeptic is guided by the natural human capacity for perception and thought—in other words, he uses his senses and mental faculties to aid in continued survival. Objects seem to fall downward, fire seems to be quite hot, water seems quite wet, etc.

2) *The constraint of bodily drives*: there are certain drives that the skeptic satisfies—hunger leads him to eat, thirst leads him to drink, sexual desire to procreate, etc.

3) *The tradition of laws and customs*: the skeptic keeps the rules, observing the conduct of life and pieties of his society. Unless living as a hermit, we have to determine how it is we wish to get along (or not) with one another, so there emerges the need for rules.

4) *Instruction in the arts*: the skeptic practices an art or profession—in Sextus's own case it was medicine—so that he can contribute to society as a whole. Some seem more gifted than others for specific types of activities. Fostering those abilities would be consistent with acquiescing to the appearances.

Notice how these criteria utilize the skeptic's acquiescence to the appearances in order to establish a pragmatic understanding of human experience. Unlike the dogmatist, the skeptic does not hold any particular metaphysical beliefs as either true or false. When confronted with problems within her experiences, the skeptic does not sway from one extreme

to the other but suspends belief as to their true nature while maintaining a level of moderation.

Like Socrates, the Pyrrhonians were extremely adept at agitating those dogmatists who were convinced of their metaphysical beliefs. Socrates likened himself to a gadfly who bothered the self-satisfied Athenians. The Pyrrhonians described their views as a laxative that was flushed out with all the rest of the waste. Today, some would call such people pains in the ass. A good skeptic today is, above all, epistemically responsible and only becomes a pain in the ass to someone who is unwilling to entertain the possibility of alternative beliefs. Like Socrates, Pyrrho, Anesidemus, etc., skeptics are good for any society. The attitudes of those who are overly dogmatic in their beliefs may directly lead to actions that have harmful effects on other members of a society—especially when stated in the form of a false dichotomy like: "Either you're with us, or you're against us [with the terrorists]" (G.W. Bush). Once we start to understand the framework within which we attain and exercise beliefs, we can better deal with conflicting viewpoints and ideas. In order to be a good critical thinker (or pain in the ass), one needs to be properly skeptical. Proper skepticism lies somewhere between blind acceptance and absolute skepticism. The former requires little (or no) critical analysis while the latter is skeptical to the point of belief suspension on practically everything.[8]

Proper skepticism, then, requires a commonsense acceptance of an environment in which one develops concepts, ideas, behavior, etc. Philosophers sometimes refer to this as *hypothetical realism*. This position maintains a very basic framework of experience. It presupposes a field of experience that includes things like people, animals, plants, stars, planets, galaxies, etc. In commonsense terms, we would call this the world and/or the universe. Unless future evidence warrants concern, a good skeptic treats these things *as though* they exist separately from one's thinking about them—that is, at the commonsense level of perception. In other words, skeptics *acquiesce to the appearances*. Science then allows us to extend far beyond this commonsense perception of the world to see things never before possible. What, then, should we be skeptical about? Generally speaking, we should be skeptical about the various ways in which we make claims about different aspects of our world. And we need to be especially skeptical toward those who make absolute claims about the very nature of our world. For the onus of responsibility always lies with those making the claims. Remember Carl Sagan's advice about extraordinary claims requiring extraordinary evidence.

But if there is no absolute criterion (or set of criteria) that we can establish with certainty, how do we distinguish good ideas from bad ones? In other words, what is our measuring stick? What can provide us with the ability to discern between good arguments and bad ones? At any given time in human evolution, we can only be expected to utilize the languages and modes of communication and expression available to us. This brute fact is called *historical facticity*. For example, Aristotle could not have discussed gene therapy just as Newton could not have discussed downloading information from the Internet. Right now, we cannot discuss ways in which future generations will describe various aspects of their world. This is simply because scientific knowledge is gradual and cumulative—we see as far as we do now because we stand on the shoulders of the world's greatest thinkers from the past and add to their cumulative effort. The measuring sticks we use today to distinguish good ideas or arguments from bad ones involve various rules of reasoning and logic assisted in relevant ways by the various sciences. We have established agreed-upon rules, which are impartial and fair to all, in an effort to establish universality. As skeptics, we have an obligation to continue to establish universal rules of reasoning in an effort to hold people accountable not only for their beliefs through *epistemic responsibility* but, more importantly, for their actions that may be harmful to others. We have a great tradition of ancient thought to thank for this. One of the driving principles of all modern skeptics today resonates from the collective works of the ancient Pyrrhonians and may be summed up in the following way: think responsibly, act accordingly. □

Notes

1. www.weeklyworldnews.com/features/aliens/.
2. www.weeklyworldnews.com/features/science/.
3. It seems to be a bit of a redundancy, then, that the name of this journal is SKEPTICAL INQUIRER. But this makes all the more obvious the gradual separation of this term from its original meaning.
4. BCE means "before the common era."
5. Ludwig Wittgenstein would later echo this sentiment in the twentieth century by saying: "What we cannot speak about we must pass over in silence." See *Tractatus Logico Philosophicus*, Routledge and Kegan Paul Ltd., London, UK, 1961, p. 74.
6. Philip P. Hallie, *Sextus Empiricus: Selections from the Major Writings on Scepticism, Man, and God*, Hackett Publishing Co., Indiana, 1985, p. 12.
7. These were called *phantasiai kataleptikai*.
8. See Mario Bunge's 2000 "Absolute Skepticism Equals Dogmatism" in SKEPTICAL INQUIRER (24) 4, 34–35.

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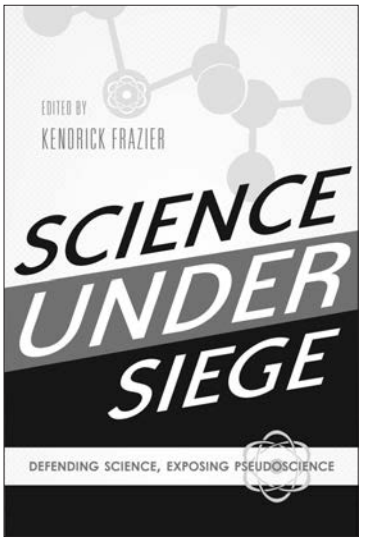

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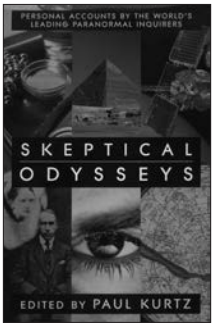

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Going Around with Flat Earth Believers

ROBERT ASHTON

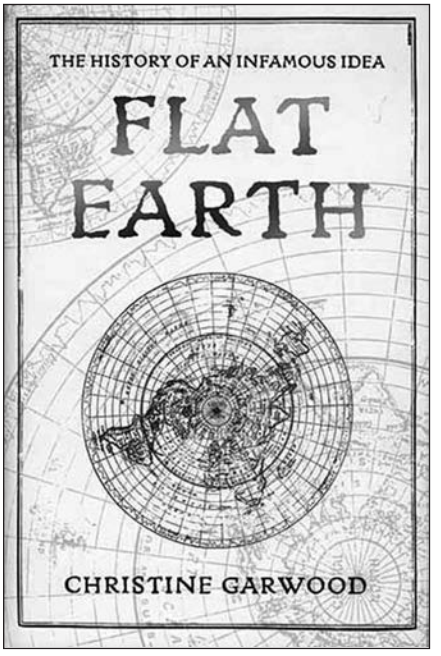
Flat Earth: The History of an Infamous Idea. By Christine Garwood. St. Martin's Press, New York, 2007. ISBN 978-0-312-38208-7. 437 pp. Hardcover, $17.95.

Just take a moment. Step outside, preferably in an open area. Can you see Earth curving away from you? Does it feel like the ground is moving or we are spinning? Earth is obviously flat and unmoving—our senses tell us so.

Christine Garwood's book *Flat Earth: The History of an Infamous Idea* is a lively, funny, and sympathetic story of those who clung to the belief of a flat Earth in defiance of almighty science. There are obvious parallels with the current debates between creationism and intelligent design (ID), most clearly in how the scientists communicate to the general public and how they should respond.

Interestingly, for Garwood, the idea of a flat Earth is actually quite a modern revival. In her "Prologue: The Columbus Blunder" she takes a hefty swing at the stories of how Columbus proved the Earth was round. She argues forcibly that "back in reality, educated medieval people did not believe the earth to be flat . . ." and educated people had not believed it since the time of Aristotle or earlier. (Of course, there were a lot of uneducated people during that time whose beliefs are lost to us.)

The Columbus legend, heavily influenced by a Washington Irving biography of 1828, of "a simple mariner" pleading his case against the church powers is, in Garwood's view, part of a wider conspiracy begun in the Enlightenment to equate religion to ignorance and reason to truth and to create a false image of a conflict



between science and religion. She makes a good argument to correct the idea that the Middle Ages were ignorant, dark times and that the church was always an obstacle to scientific thinking. Throughout the book, it is clear that Garwood believes that the split between religion and science is overstated. However, she really doesn't present a case as to why the scientific method and religion are reconcilable.

The core of the book is the story of a mixture of charlatans and honest believers in a flat Earth and some of the scientists who got caught up in it, notably the co-discoverer of natural selection, Alfred Russel Wallace. Garwood's story starts with an English "travelling lecturer and quack doctor known by the pseudonym 'Parallax,'" who in the mid-1840s launched a career in the propagation of the idea of a flat Earth. He named his approach "zetetic" astronomy, using an existing label of skepticism and free-thinking. By combining a mistrust of the increasingly elitist scientific community, biblical authority, and great presentation skills, he was able to spread his thought through writing, public demonstration, and debate. As one correspondent in a local paper said: "Without endorsing 'Parallax's' teachings, it must be said that he advanced them, supported them, and fought for them with a skill and intelligence, tact, and good temper which were not at all equaled by his opponents."

These ideas were picked up by a Christian polemicist and probable true-believer called John Hampden, who abandoned the "gentlemanly style" of Parallax. "He swore that he would 'rest not day or night' until he witnessed the overthrow of globular theory." As proof of his commitment he offered the substantial sum of £500 as a wager to anyone who could disprove his beliefs. Wallace, to the chagrin of the scientific community, took up that challenge, and at the Old Bedford Canal in a remarkably flat part of Eastern England

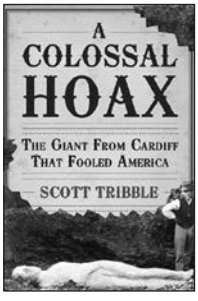
Robert Ashton has recently retired from a business career in law and human resources. He is now a consultant, actor, and writer living in St. Louis.

demonstrated the curvature of the Earth. He set up a surveyor's telescope six miles from a bridge that had a large sheet with a band painted across it and a marker set between the telescope and bridge, at the same height above the water. If the telescope is leveled and the world is curved, the middle marker should appear below the cross-hairs in the telescope but above the band on the bridge farther down the canal and, of course, it did. However, for Wallace this led to lawsuits, isolation from the scientific community (as one snob put it, he had "lost caste terribly"), and a continual barrage of abuse and threats. For Hampden, whose interpretation of events was filtered through his strict religious beliefs, Wallace's "proof" was clearly a fraud.

Garwood traces the continuing history of this idea in England and North America, including the creation at the turn of the twentieth century of a Christian Utopia in Illinois called Zion. After the original leader was deposed, the city was run by Wilbur Glenn Voliva, who actively pursued his beliefs in a flat Earth. Voliva remarked that Williams Jennings Bryan in the Scopes trial "doesn't go far enough in his fundamentalist belief. . . . If Bryan repudiates modern theories of biology, he ought to repudiate modern theories of geology and astronomy as we do." The Zion community, based on the laws of the bible, was initially a success but ultimately succumbed to scandal, corruption, and weariness with the strictness of life there.

Despite the overwhelming evidence, which increased dramatically with space flight, the idea of a flat Earth persists with denials of the moon landing, "New Age" mysticism and conspiracy theory, and the creation of the Flat Earth Society (FES). Originally called the FESC (the "C" for Canada was later dropped), this organization was clearly tongue in cheek, apparently fuelled significantly by alcohol, but made a serious point about blind belief in religion and now in science. As one of the founders said, "We're not really obsessed with the shape of the Earth. We say it's flat to dramatize our desire to keep our God-given senses from being numbed by technology."

In her subtitle and throughout the book, Garwood refers to this "infamous idea." At one point she even claims it is "the world's most infamous, erroneous idea." Really? More infamous than Hitler's belief about the Jews or that slavery is a natural state ordained by God? I think in this point she goes too far—it was a belief held by relatively few people and caused little damage. However, I believe it does provide some interesting parallels in the more serious fight with creationism and intelligent design. Many of those who espoused a flat Earth were well-read, genuine believers. They appealed to "common sense" and a skeptical approach to received knowledge from elitist and often arrogant scientists. Of course, they also failed to apply their "zetetic" principles to their own beliefs, usually driven by a fundamentalist interpretation of the bible. Nevertheless, there are lessons that can be learned from this well-written book as we try to manage public opinion in the debate on evolution. □



Cardiff's Giant Hoax

JOE NICKELL

A Colossal Hoax: The Giant from Cardiff that Fooled America. By Scott Tribble. Rowman and Littlefield, New York, 2009. ISBN: 978-0-7425-6050-5 (0-7425-6050-3). Hardcover, $39.95.

The Giant from Cardiff was certainly what the title of Scott Tribble's *A Colossal Hoax* (2009) proclaims—the *Encyclopedia of Hoaxes* even suggested it was "perhaps the best-known American hoax." Less well known are the story's complexities and enigmas—some of which fascinated and engaged me long before Tribble produced his history of the affair (Nickell 1995, 231; 2005, 342, 346). It is clearly the definitive work on the subject.

Joe Nickell is CSI's senior research fellow. His numerous books include Real or Fake *(forthcoming from University Press of Kentucky). His Web site is at www.joenickell.com.*

The Hoax

On October 16, 1869, at Cardiff, New York, workmen on the farm of William C. Newell unearthed what was alternately claimed as an ancient petrified male colossus, a mysterious statue, or a clever fake.

Newell purchased a large tent and attracted hundreds of persons a day, each paying fifty cents to view the naked, anguished-looking, recumbent, stone giant over ten-feet in length. After the colossus was moved to Syracuse, even more people lined up for a look. One was fossil expert John Boynton, who pointed out the lack of any precedent for the transformation of human or animal flesh into stone. Boynton and New York state geologist, Prof. James Hall, concluded that the figure was a statue. Others disagreed, noting the absence of a pedestal and the peculiarity of a sculpture depicting a reclining figure writhing in agony.

Finally, it came to the attention of Othniel C. Marsh, the distinguished paleontologist from Yale. "It is of very recent origin and a most decided humbug," he reported. Marsh called attention not only to the polished surfaces of the stone, which belied a lengthy burial, but also the presence of fresh tool marks. Boynton revisited the site and agreed with Marsh's findings.

Despite the exposé, the public remained eager to view the giant, and attendance soared when it was exhibited in New York City. Famed showman P.T. Barnum sought to buy the figure, but when he was rebuffed, he purchased a plaster copy and displayed it as if it was the genuine stone figure—a hoax of a hoax!

Meanwhile, the true story began to emerge: The conception was that of one George Hull, a cigar maker and brother-in-law of Cardiff farm owner Newell. Hull obtained a block of gypsum in Iowa, shipped it to Chicago for carving and "aging" with acid, and then transported it by train to a depot near Binghamton, New York. From there it was hauled to the Newell farm site and buried. Nearly a year later, it was uncovered by workmen supposedly hired to dig a well.

Photo: Joe Nickell

Figure 1. The Cardiff Giant (in an earlier display) at the Farmers' Museum, Cooperstown, New York

Hull said the idea for the hoax came from an argument he had with a clergyman over the assertion in the biblical book of Genesis that "There were giants in the earth in those days." Hull envisioned a moneymaking spoof involving the creation and burial of such a "giant" in the earth. (Today, Hull's creation may be viewed at the Farmers' Museum in Cooperstown, New York, where I have examined and photographed it [see figure 1].)

In 1876, George Hull hatched a new scheme. He commissioned another figure—the Colorado giant—which was cast from artificial stone. The first cast was broken during handling, requiring the process to be repeated. However, despite years of effort and thousands of dollars (two thousand advanced by the irrepressible Barnum), the sequel hoax was an abysmal failure. (So were other petrified-men hoaxes, including a Pine River Man, "discovered" in 1876, and the Forest City Man, displayed at the World's Columbian Exposition in Chicago in 1893 [MacDougall 1958, 23–24; Nickell 2001, 4–9].)

Proliferating Fakes

Barnum's plaster copy and subsequent replicas represent only one of many interesting sidelights on the giant story. According to Tribble (2009, 167, 219–224), those who believed the stone figure was a petrified giant long argued that no sculptor could make such a seemingly realistic object. (This argument has also been used in defense of the Shroud of Turin, crop circles, and many other alleged paranormalities [Nickell 2001, 70–83, 150–156].) Sculptor Carl Franz Otto of Syracuse, New York, accepted the challenge, making several trips to study the giant's pose and features. Instead of carving stone, however, he modeled a full-size figure in clay, cast a mold, then filled it with a mixture of plaster of Paris, marble dust, and additional unidentified ingredients.

Otto was commissioned not by Barnum, as the showman later asserted, but by a trio of local businessmen—a tailor, druggist, and distiller. Nevertheless, Barnum did acquire Otto's first fake but use of a mold allowed multiple copies to be made. Reports Tribble (2009, 176):

> Even Barnum fell prey to imitations, with entrepreneurs quickly attempting to duplicate the great showman's success. Over the course of December, Otto received several orders for new imitations, and the sculptor soon began manufacturing Cardiff giants at a frenzied pace. Russell R. Lewis purchased Otto's second imitation for five thousand dollars, exhibiting the giant in his native Utica. On December 20, the *Journal* reported that Otto sold yet another imitation for three thousand dollars, and this giant eventually cropped up at Colonel Joseph H. Wood's museum in Chicago. Still another replica played to crowds at the Bastable in Syracuse over the holidays, and, over the next few weeks, non-Otto imitations surfaced in Springfield and Worcester, Massachussetts, as well as in Philadelphia and Des Moines. In noting the appearance of a giant—fittingly enough—in Binghamton, the *Journal* wearily asked, "How many are there?" A few weeks later, after reporting on the shipment of an Otto imitation to Montreal, the newspapers noted that the sculptor had a standing order for six additional giants.

Tribble (2009, 248) says one of Otto's imitations is now at Circus World Museum in Baraboo, Wisconsin—ironically, where Cardiff Giant creator George Hull lived for a time in 1867 while dreaming up his colossal scheme.

At least one entrepreneur (unmentioned by Tribble) supposedly made a copy of papier-mâché and billed it as "the original," according to the Fort Museum, Fort Dodge, Iowa ("Cardiff" 2009). Details are not given, but this may be the one exposed by a disgruntled trapeze artist, Madame Sanyeah (or Senyah). In 1871, she left P.A. Older's

Museum, Circus, and Menagerie in Rochester, Minnesota, due, she said, to the manager's ungentlemanly conduct. She published an accusatory circular, claiming that the circus's Cardiff Giant was composed of only paper and paste, and that the concern perpetrated other deceptions. The local newspaper sarcastically commented, "The allegation that there is any humbug of deception about a circus is terrible to contemplate" ("Senyah" 2008).

In 1972, I encountered a replica of still other composition. This was at a "ten-in-one" (carny talk for a sideshow with approximately ten features under a single tent) at the Canadian National Exhibition. Among the banners was one for the "Cardiff Giant—10 ft. 4 ins." The portrait was that of a very tall man, and the talker (or barker to non-carnies) spieled: "He's a big son of gun!" However, fine print on the banner indicated that the giant was not a living person, stating, "This is a facsimile." Inside the tent—at the end of a long platform following a rubber man, a fire-eater who did double duty as a sword swallower, and some illusions—was the giant: a concrete version of the Cardiff original. I later photographed it—or a similar one—at the Bobby Reynold's sideshow museum at the 2001 Erie County Fair in Hamburg, New York. (See the photo in Nickell 2005, 344.)

In the course of my research (aided by CFI Libraries director Tim Binga) I learned of alleged gypsum copies of the colossus. According to the December 28, 1869, issue of Indiana's Fort Wayne *Daily Gazette*, "Several copies of the Cardiff giant are said to be in course of preparation from the gypsum quarries of Fort Dodge, Iowa." I have been unable to confirm this claim or to account for any of the allegedly carved—as opposed to molded—early copies. (One now in the Fort Museum at Fort Dodge, Iowa, is a modern replica sculpted from the same gypsum used for the original; it was prepared for the one-hundredth anniversary of the hoax ["Fort" 2009; Tribble 2009, 246].)

Controversy Continues

I have often wondered what became of Barnum's copy. According to Roadside America, "P.T. Barnum's fake is propped up in the rear of Marvin's Marvelous Mechanical Museum, Farmington Hills, Michigan. At least, if you believe Marvin, who promotes it as such" ("Cardiff Giant Battles" 2008). The claim is accepted by Wikipedia ("Cardiff Giant" 2008). Tribble's view is that the museum "possesses one of Carl Franz Otto's imitations" (2009, 248), not necessarily Otto's first fake that went to Barnum. To determine now among Otto's proliferating plaster phonies just which—if any—was Barnum's, would seem best determined by provenance. (This refers to the origin or derivation of an artifact, to its being traceable to some particular source or quarter. The provenance of a piece helps establish its historical connection and, potentially, its authenticity.)

I spoke with Marvin Yagoda, the owner of Marvin's (2009), who says he purchased his giant from an auction at Sotheby's in New York, September 16–17, 1994. Unfortunately, Sotheby's catalog for the exhibit (the Dr. James W. Smith, Jr., collection of penny arcade machines) states (perhaps erroneously) that Marvin's giant is made of papier-mâché (painted brown); worse, no credible provenance leads back to the famous showman—only a claim that it was once at the Danbury, Connecticut, Fair. The figure is accompanied by an old sign that shows it was once on exhibit, but this is of twentieth-century style and professes to accompany the original Cardiff Giant that—confusedly—Barnum is incorrectly said to have exhibited (Marvin's 2008). Perhaps these issues can someday be resolved.

Meanwhile, it must be noted that in February 1870, Barnum and his partner, George Wood, acquired a second replica of the giant, whereupon Wood's Museum and Menagerie began to promote its "two original Cardiff giants." Tribble adds:

> Amid all those reports of Cardiff giants, the fate of Barnum's imitation became increasingly unclear. In 1871, the *Syracuse Daily Journal* noted that the showman's menagerie included a "fac-simile of the questionable petrified monster," though this imitation easily could have been the second one that Barnum acquired. Many years later [in 1887], the *Springfield Union* reported that the "original and genuine" giant lay beneath Daly's Theater, the former site of Wood's Museum: "When the museum was converted into a theater, the Cardiff giant was one of the high-priced curiosities, but it was so heavy that it wouldn't pay to cart it away, and so a hole was dug under the building and the alleged petrifaction was buried without ceremony." The Union, of course, erred in characterizing this giant as the original, but, still, the item leaves open the possibility that Barnum's first giant never left the Empire City—and, in fact, may still be there. (Tribble 2009, 189, 223–224)

Then again, that could be merely an urban legend of its day—a fake of a fake of a fake! □

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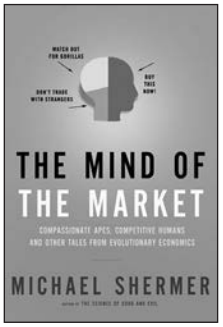

Putting Your Money Where Your Mind Is

JOSEPH KEIERLEBER

The Mind of the Market: Compassionate Apes, Competitive Humans, and Other Tales from Evolutionary Economics. By Michael Shermer. Times Books/Henry Holt and Company, New York, 2008. ISBN 978-0-8050-7832-9. 208 pp. Hardcover, $26.

Money makes people do irrational things, as demonstrated by scientific studies and common experience. Yet millions of people acting under the influence of money add up to a functioning economy. In *The Mind of the Market* Michael Shermer attempts to make sense of this seeming paradox by drawing on evolutionary science. Shermer, the editor of *Skeptic* magazine and author of several books on skepticism and scientific thinking, argues that economics ultimately comes down to evolution—not only in the sense that economies are the result of humans' biologically evolved capacity to trade goods but also in the sense that economies evolve in a manner akin to the evolution of organisms. Shermer writes that evolution and economics are really the same thing: a "complex adaptive system" composed of many individual agents interacting and exchanging information. Out of many simple interactions emerges a complex, ordered system that is more than the sum of its parts. Shermer argues that to understand how an economy works we must view it as an entity that evolved from the bottom up through a process similar to natural selection.

Shermer presents his hypothesis of deep connections between biology and economics as though it were a logical extension of Darwinian thinking. However, in advancing this argument he twists evolutionary theory into strange shapes. Early in his book he explains that an economy is a complex system that emerges from many people acting for the sake of themselves and their children and that, likewise, "evolution is a complex system that emerges out of the simple actions of organisms just trying to survive and provide for their offspring" (p. 5). Biological evolution is a process of change. It is not, like an economy, a system made of interacting parts. The complex systems that have resulted from biological evolution (that is, organisms and ecosystems) may be similar to economies, but Shermer's attempt to attribute evolution to the efforts of organisms (and apparently only brood-rearing animals at that) just doesn't work. Later he writes, "An ecology is a complex adaptive system that evolved to solve the problem of how so many unrelated organisms and species in large biological communities can coexist in relative harmony" (22) and that "an economy is a complex adaptive system that evolved to solve the problem of how so many unrelated strangers in large cities can coexist in relative harmony" (23). An ecosystem (presumably what Shermer means when he writes "ecology") does not "solve the problem" of how to make species live together any more than a solar system solves the problem of how to make planets orbit a star.

Later, Shermer declares that species evolve not only by gradual modification but also by "revolution (sudden and dramatic change)" or "discontinuous leaps" (60). This claim may bolster his analogy between evolution and economics, but without giving the controversial concept of discontinuous evolution the caution it deserves, Shermer's reasoning appears reckless. He also skims game theory by claiming that the panda's "thumb" (a modified wrist bone used for stripping bamboo leaves) is an "Evolutionary [*sic*] Stable Strategy" (49). Shermer fails to explain that John Maynard Smith's theory of evolutionarily stable strategies applies only when the fitnesses of competing strategies are dependent upon their frequencies in the population. Thus, the panda's thumb is not an evolutionarily stable strategy but rather an adaptive peak.

In chapter 12, having devoted more than two hundred pages to making the case for the biological roots of economics, Shermer reassures readers that their economic choices are not purely biologically determined.

In chapter 12, having devoted more than two hundred pages to making the case for the biological roots of economics, Shermer reassures readers that their economic choices are not purely biologically determined. As evidence he cites the statistical relationship between human height and weight. The coefficient of determination (the r^2 value) for the correlation between height and weight in adults is 0.49. Shermer explains that this means "49 percent of one's weight is accounted for

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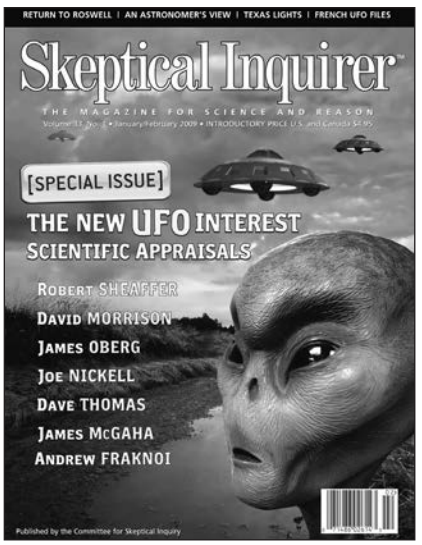
by one's height, which means that fully half of your weight is under the control of environmental conditions such as diet and exercise. . . . You won't find a trait much more biologically determined than the relationship of height and weight, and yet even here you get to control half of the variance yourself by freely choosing to manipulate your environment and lifestyle choices" (233–4). The statistical misunderstandings in this example derail Shermer's argument. *Coefficient of determination* is a measure of how much of the variability in Y can be modeled by the correlation between X and Y, not a measure of how much of Y is caused by or controlled by X. *Variance* describes how spread out the measurements are of a trait within a group. An individual's weight has no variance. The statement, "you get to control half of the variance yourself," is absurd.

In chapters 5 and 6 Shermer reviews discoveries made by psychologists and neuroscientists that show how humans frequently act against their own economic self-interest and how the human brain creates biases that often hinder our ability to perceive economic information accurately. Shermer's explanations of these findings are interesting and worthy of a book of their own. The use of laboratory techniques to test the hypothesis that human economic decision-making abilities are carryovers from our evolutionary past is more enlightening and more scientific than the reasoning by analogy in which Shermer engages throughout most of the book.

The great weakness of *The Mind of the Market* is that it is as much a work of advocacy for Shermer's preferred economic policies (he admits this candidly) as it is a work of descriptive science. The only reason Shermer attempts to graft his economic philosophy onto biological evolution is, it seems, so that he may claim to have Darwin on his side. Shermer's explication of the relationship between evolutionary psychology and economics would work much better as its own book, as would his opinions on economic policy. In putting the two together, Shermer ends up abusing science. *The Mind of the Market* is a reminder that readers must never set their skepticism aside, no matter how much they want to agree with the author. □

LETTERS TO THE EDITOR



Our UFO Special Issue: The Readers Debate

The January/February 2009 SKEPTICAL INQUIRER issue on UFOs extensively explores natural explanations of unusual lights or objects people have seen in the sky in recent decades with the assumption that "alien visitors" is a paranormal or mythical explanation.

Only the astronomer Andrew Fraknoi directly confronts the possibility of an alien visit. He briefly argues that the astronomical distances would make a casual visit by aliens from even the nearest star far too costly.

It seems to me that this approach could be expanded by figuring out how long it would take for a space ship using a reasonable amount of energy and cost (not science-fiction speed-of-light travel) to reach the Earth from a neighboring star.

One could then question the assumption of SETI that there is intelligent life close enough to communicate with us. From how far away could we hear a radio signal as strong as we can send? I expect it would be limited to a few neighboring stars, if that far. Life may evolve on hospitable planets, but what is the chance of it evolving into intelligent life close enough and with a desire to contact us now? The chances of such intelligent life developing and trying to communicate with us at the exact split second in geological time that we have developed the capability to listen is vanishingly small.

David W. Briggs
Marion, Massachusetts

Thanks for an interesting thirty-seven-page cross section devoted to "UFOs: Fact and Fiction," in the January/February 2009 issue. Missing from the discussion, however, is a scientific reason for "Why Visiting Alien Spaceships Are Impossible." That is the title of my June 2008 article in *Skeptical Briefs* [also published by CSI].

The argument is that the interplanetary distances are so vast that a spaceship has to go at one-tenth the speed of light to get to Earth in a reasonable time (like 100 years). The kinetic energy needed to reach this velocity is so huge that it is beyond the capability of *any* civilization. Remember that the vehicle has to carry its own fuel, and the laws of physics and chemistry are the same everywhere in the universe.

The relatively simple calculations are given in the *Skeptical Briefs* article. They have radically altered my perspective when I read a UFO article or news release. I *know* that visiting spaceships are impossible; this attitude is unwelcome in the SKEPTICAL INQUIRER, but it sure does simplify matters, and it provides a breath of fresh air.

Sid Deutsch
Sarasota, Florida

I would like to add another possible cause of "Lights in the Sky" phenomena. Working on the fourteenth floor of an office block with an impressive view of the River Mersey and Liverpool Docks, I keep a pair of cheap but high-power binoculars on hand to allow for closer views of ships using the docks. One day, as I watched a Royal Navy support vessel entering the docks about two kilometers away, I saw a number of brightly glowing balls moving above the ship. My first thought was of silver party balloons floating over the docks, but they appeared too large, too fast, and moved in all directions. As I watched, they appeared to change speed and size and to disappear and reappear in the manner of many so-called UFO sightings.

The mystery was solved when I refocused my binoculars and a light transformed into a seagull in the near foreground, about 500

meters away. The remaining lights were similarly transformed and, as the birds turned toward me, the sunlight would catch their white chest and they would "light up." When they turned away, all I could see were their gray backs against the background of the docks. The effect is quite easy to reproduce and could appear quite convincing on a zoomed video camera with the out-of-focus birds blinking on and off and seemingly traveling at great speed across the frame. It does help if you are higher than the birds so they can blend in to the background.

Pete Muldoon
Southport, U.K.

Re: "UFOlogy 2009: A Six-Decade Perspective"— In the October 3, 2008, *Science* (pp. 115–117) are results of a study titled "Lacking Control Increases Illusory Pattern Perception." The thrust of the study is that whenever people feel that (their) lives are out of control, illusory correlations are made. These correlations involve superstitions, conspiracies, politics, religions, etc.

In reality, this is not much different from what Carl Jung stated in *Man and His Symbols* when he mentioned that people begin to project religious images, UFOs, aliens, etc., from their psyche when the world is perceived as threatening. We'd all like to have a world that is predictable. So, whenever life is not predictable we create things that seem to somehow bring about a consistency in our world.

Alex Holub
Los Angeles, California

Great issue on UFOs! Maybe you could do one on the tooth fairy next.

Rodney Crislip
Portland Oregon

I did not believe in aliens arriving in UFOs until receiving the first issue of the year of SI. There I learned of "the new UFO interest." Moreover, I learned that there are quite a number of aliens among us. And all of them are lodged in SI.

Indeed, who but an alien could get excited about UFOs at a time when the big news of the day is that the world economy is crumbling? Worse, it is not crumbling because of belief in UFOs, Big Foot, intelligent design, or even God, that great Satan of ours. The economy is crumbling because of faith in standard economic theory. The latter, not popular superstition about the supernatural or the paranormal, is the conceptual basis of the free (unregulated) market.

And yet we have known since 1929, and particularly since John Maynard Keynes published his great book seven years later, that the capitalist economy is inherently unstable and doomed to break down unless subjected to strict regulations. But the skeptical movement has never attacked that theory. Moreover, it has ignored all the scholarly criticisms of it, from Marx to Keynes to Soros.

My explanation of the economic blindness of my skeptical friends is that they are aliens: they do not live in the real world of layoffs, foreclosures, bankruptcies, and corporate corruption and incompetence. We, the friends of SI, should have seen earlier that the single skeptical eye is bound to see only one-half of the world of superstition and pseudoscience: that concerning nature. To see what is wrong with popular superstitions concerning society as well as nature, one needs two skeptical eyes.

Dear aliens: Welcome to our planet, learn about our real social world, and move from SI to an ordinary motel.

Mario Bunge
Fellow of CSI
Frothingham Professor of
Logic and Metaphysics
McGill University,
Montreal, Canada

I am a huge fan of SKEPTICAL INQUIRER and look forward to receiving every issue with eager anticipation. I enjoy reading about all the misconceptions, half-truths, and myths that surround us that you so diligently debunk. However, I was very disappointed in last month's "UFO" issue. Haven't we all decided (particularly skeptics and the scientific community) that the whole UFO thing is a dead duck by now? Why waste a whole magazine revisiting stuff that all but a few crackpots put to bed years ago as complete silliness?

Jon Garon
Naples, Florida

Your UFO special was enough for me to finally spring for my first issue of SI. I was not disappointed! Great topics (including the Ark and XanGo Juice) and fine writing. Any chance of doing a special issue on the Sasquatch controversy?

John Navroth
Kirkland, Washington

I recently perused your special issue on UFOs in my local library. Frankly, I thought you could have done better. For example, there was nothing about the excellent work of Stanton Friedman or Timothy Good in examining the phenomenon from a rigorous perspective. There was no mention of several excellent cases, including the so-called Flatwoods Monster or the Yukon UFO sighting of the 1990s.

Rod Drown
rpdrown@hotmail.com

Editor Kendrick Frazier replies to Rod Drown:

I think it fair to say that we disagree with your characterization of the work of the two writers you mention. As for the Flatwoods Monster, Joe Nickell's five-page SKEPTICAL INQUIRER *column "The Flatwoods UFO Monster" (November/December 2000) described his detailed investigation into this claim. Nickell documented that this "shining eyes" apparition was—yes—most likely an owl, specifically* Tyto alba*, the common barn owl. Readers can find Nickell's article on our Web site at csicop.org/si under List of Online Articles.*

I read the more interesting articles in the recent issue regarding UFOs and aliens. As I suspected, even those erudite authors subscribe subtly to a bias toward the debunking stance. I suppose that to remain skeptical, that's part and parcel of their job. More's the pity.

These are some of my criticisms regarding their approach:

1. None of them were ever present to witness what the observers saw. Their closest approach was all second-hand, if even that, so I'm not at all surprised that they find witnesses' descriptions difficult to believe. Hence, the skepticism. Until you've seen a UFO or an alien for yourself, there are no words for the experience.

2. Questions they posed were leading questions and they allowed the military time to come up with an "explanation" for whatever was reported to have been seen. Rather than allowing the military to respond objectively, spontaneously, and without prompting, the debunkers gave them a particular direction to head in and then awaited their "carefully fabricated answers" to be sure that they matched what the debunkers wanted them to say.

3. Where evidence and reported sightings could not be "easily explained away," the debunkers did what they always do: they simply swept the entire set of reports under the

carpet and pretended that there was nothing of value there at all. Case closed. That's called "playing ostrich."

4. And if all photographic evidence is that suspect, then no driver's license picture is legitimate, either!

I am unimpressed with the skeptical inquirer, as your magazine characterizes him or her. The inquirer part doesn't go nearly far enough and the skeptical part is way too heavy on evidence. "Balance" is not a good word to use here. Looks to me like a Mexican stand-off. Unless the inquirer is standing by my side watching what I am watching, all bets are off.

Maybe we even need a new way to observe these alien phenomena. They don't seem to be repeatable in the old "scientific method" way of doing things. It's not as though anyone can command a UFO to appear. And for darned sure, UFOs and aliens are not going to submit to a laboratory analysis at our particular convenience. We have to learn how to deal with them, it seems to me. There's no requirement that they must fit our paradigms and expectations. After all, they are as alien as they can be.

Doug Parrish
Howell, Michigan

Author Robert Sheaffer responds:

Mr. Parrish laments that none of we skeptics "were ever present to witness what the observers saw." This is because the aliens seldom if ever call us in advance to let us know when and where they are planning to appear. Nor do the witnesses themselves, except on rare occasions, ever inform us, or more realistically, inform local news organizations and emergency personnel while they have the alien craft in plain sight (even though such sightings often last for many minutes). And in the few cases when the phenomenon is well-reported while it is still ongoing, it invariably turns out to be something ordinary, such as a lighted balloon or the flares of the Phoenix lights.

His suggestion that we skeptics are working in tandem with the military is beyond hilarious (as if any military leaders would pay any attention to us). He seems to have forgotten that the Air Force closed down its UFO investigations in 1969. The only interest in "unknowns" that the military has today is in identifying any potentially threatening object entering U.S.-controlled airspace. No such objects have ever turned out to be alien spacecraft.

Mr. Parrish seems to have lost confidence in the "old" scientific method because it has not been able to validate his beliefs in UFOs, supposedly because the UFOs do not appear on demand. But this "old" scientific method has been highly successful in capturing and studying a long list of other phenomena that occur unpredictably, such as atomic decay, genetic mutation, tornados, etc. Statistical methods, high-speed photography, sophisticated detection methods, etc., have succeeded in capturing and studying a wide range of unpredictable and often brief phenomena. That these same methods have failed in capturing any data about UFOs strongly suggests that there is no meaningful scientific data about them to be gathered. Instead, it appears that human psychology is the proper discipline to bring to the fore.

I was quite disappointed at the one-sided writing of Dave Thomas in his January/February 2009 article "Roswell Update: Fading Star?" The piece paints the participants, in particular those in the military that initially reported the craft, as bumbling and less than trustworthy. These were well-trained Army/Air Force personnel stationed at one of the most important military bases in the world.

If you watch video and read testimony by Jesse Marcel, Jr., son of the late Major Jesse Marcel, among the first to see and examine the crash debris, it is obvious that what he was shown and told by his dad was not material from a weather balloon or any other military experiment. I would like to have seen Dave Thomas talk to him for this story.

Though her operating the UFO Museum might seem, to some, to be a conflict of interest, a conversation with Julie Schuster would also have been enlightening. Her dad, the late Lt. Walter Haut, wrote the initial press release announcing an alien crash. I met and spoke to both individuals several years ago and their tales are compelling. As a public-relations professional myself, I know that the charge that Haut made up the contents of the release to attribute events to aliens is in stark contrast to how the military normally operates.

Also of incredible interest (and ignored in Thomas's article) is the testimony given by the late Glenn Dennis, with whom I also spoke prior to his death. Dennis, a mortician, relayed to me and has gone on the record that, as a youth, he worked at the local funeral home in Roswell.

Around the time of the crash, he and his employer were asked about the smallest, most hermetically sealed coffins that could be provided. They were also asked about processes for dealing with bodies that had been left out in the elements. Evidently, the bodies' chemical or physiological makeup was perplexing the examiners. He also told me about his conversation with a friend and nurse who had seen alien bodies at the base as well as of being physically threatened by military police.

My point in all of this is that Thomas and your publication are too quick to discount the possibilities that something truly extraterrestrial crashed outside of Roswell. There is credible testimony and scores of signed affidavits from military personnel who played one role or another surrounding the events of 1947.

Don Tanner
Detroit, Michigan

Dave Thomas replies:

Don Tanner seems to be giving a lot of credence to the huge Roswell mythology developed by UFO proponents. This credence is not warranted. In particular:

1. Major Marcel was an expert in assessing bomb damage from aerial photographs. He had never seen the seldom-used radar reflectors used in project Mogul and was likely led astray by what looked like "alien writing" on the reflector support struts.

2. Marcel's son saw these strange symbols once, in the middle of the night. In contrast, project scientist Charles B. Moore saw the curious symbols during several Mogul launches. The strange symbols were eventually traced to reinforcing tape used by a Manhattan toy company that started making radar reflectors for the Army Signal Corps during World War II.

3. Walter Haut did not originate the infamous press release. Rather, he was most likely directed to do so by the base's "Intelligence Office"—and that means by Major Jesse Marcel himself.

4. Statements mortician Glenn Dennis made about being questioned by army doctors regarding small, hermetically sealed coffins and the preservation of bodies conflict with his later declarations that two pathologists from Walter Reed Hospital performed autopsies on the "alien" bodies. Why would high-ranking medical experts need to ask the local mortician for medical advice?

5. The nurse that mortician Glenn Dennis described was first identified by Dennis as "Naomi Self" in 1989. In 1992, Dennis said the nurse's name was really "Maria Selff." In 1993, Dennis changed his story that the nurse was killed in a plane crash and said she had joined a convent. In 1995, Dennis told researcher Victor Golubic that "Naomi Self" was not the nurse's real name at all. Pro-UFO author Kevin Randle declared in 1998 that Dennis was no longer believable "for changing the name of the nurse once we had proved she

didn't exist" (Randle 1998).

I don't think that I was "too quick" in deciding that a spaceship never crashed near Roswell. Consider this assessment by the man at the center of the "incident," Major Marcel himself, upon being asked if the debris he saw was from a rocket: "Oh no. Unh unh. I've see rockets sent up at the White Sands testing grounds. It definitely was not part of an aircraft, nor a missile or a rocket" (Pflock 1994).

What is clear is that in the over ten years that elapsed since the heyday of the Roswell Incident (1997's 50th anniversary) the story has not gained any new, credible support.

Experimental Philosophy?

When Sir Isaac Newton wrote his masterpiece, *Philosophiae Naturalis Principia Mathematica* (*Mathematical Principles of Natural Philosophy*), he thought that he was doing philosophy like numerous empirical philosophers before him ("Experimental Philosophy, an Oxymoron?" SI, January/February 2009). Only after university departments created separate physics, biology, and psychology departments did people then look backward in time and see these activities as unphilosophical. And once philosophers started seeing empirical philosophy as an oxymoron, there was little left for them to do that was useful or interesting. Nonetheless, they still needed some activity to justify their existence and allow them to produce doctoral theses and peer-reviewed journal articles, hence, interminable conceptual analysis. Once burnt, contemporary philosophers wisely chose an activity that no one would ever want to steal from them.

Don Nigroni
Glenolden, Pennsylvania

Thanks to Massimo Pigliucci for a timely article on experimental philosophy. I always enjoy reading his column "Thinking about Science."

Dr. Pigliucci is correct in noting a connection between experimental philosophy and social science. Experimental philosophy seems to be crossing between what people ought to do to what they actually do, which is the domain of social science. His description of Joshua Knobe's experiment looks very much like a study one might find in the *Journal of Experimental Psychology.*

To recap, the study examines people's moral evaluations of a hypothetical CEO making decisions about his company that may affect the environment. The CEO considers only the corporate bottom line, disregarding perceived or actual risk to the environment. Pigliucci says, "Kobe [*sic*] gave his subjects two versions of his story: one in which the actions were predicted to, and in fact did, harm the environment, and another in which the actions were predicted to, and in fact did, help the environment." The finding was that the CEO was not praised for any benign effects but was blamed for ill effects.

If this outcome surprises you, try changing "the environment" at the end of each alternative to "other people." You can get away with disregarding other people provided you do not harm them, but don't expect accolades for doing so. And you will be blamed for ignoring clearly predictable damage following from your decisions even if you did not intend it to happen. This is the basis of the legal concept of "negligence." Since we now recognize that harming the environment leads to harming other people, the principle generalizes.

Leigh Thorpe
Ottawa, Ontario

The idea of asking people about perceived intentions and morality may be new to something called experimental philosophy, but it has been part of the tradition of social psychology for quite a long time. Lawrence Kohlberg developed the technique in the 1960s, so its use by current philosophers is derivative. Professor Pigliucci would have us believe that this is innovative, but it clearly is not.

Asking lay people about the validity of St. Anselm's ontological argument may inform you about how lay people digest that argument, but it will not inform you about the logical validity of that argument. (For me, Immanuel Kant laid *that* debate to rest a couple of hundred years ago, but that's beside the point.) Yes, there is value in understanding how lay people think about such matters, but that belongs more in moral psychology than moral philosophy. (Disclosure: I am a mathematical social psychologist.)

Don't get me wrong. I encourage philosophers to learn about how psychologists have approached issues that intersect with philosophical thought (and that includes almost all of both psychology and philosophy) and for philosophers to contribute to empirical examinations of these issues. Indeed, I have learned much from such stalwarts as John Rawls, Dan Dennett, and Jay Rosenberg.

James Paul Kahan
Portland, Oregon

Street Lamp Interference?

Regarding "The Curious Case of Street Lamp Interference" (January/February 2009)—I'm writing to drop my own perspective on this absurd phenomenon. I encountered a case of this "Street Lamp Interference" during my teenage years. Despite being a thirteen-year-old boy of no notable intelligence, I was able to solve the puzzle and even replicate the circumstances reliably.

It happened to a neighbor of mine who was terribly superstitious. At first I didn't believe her and was convinced that it was just a normal coincidence made significant in her mind by the suggestions of a malicious friend. But on some days she was able to demonstrate the phenomenon reliably. We couldn't figure it out until one day she'd loaned her jacket to another girl who was complaining about the cold. The jacket in question was brightly colored, with a huge reflective patch on the back. Thinking back, we realized that she'd always been wearing that jacket on days when the light was harassing her. As long as the reflective patch was pointing at the light, it would shut off for about thirty seconds, then turn back on and shut off again.

We later noticed that this particular street lamp had a small dot at the back of the fixture. On another night I got together with the guys and we gathered as many flashlights as we could find. After asking around a bit we discovered that the little dot was a photocell. It turned the lights on at dusk and off at dawn. Since the cell was pointed down and was so close to a light source, it was prone to interference from reflections. To rule this out it was programmed to shut off only that light and wait. If the light level stayed high it would shut off the other lights and if not, it would turn back on.

Regrettably I can no longer replicate the circumstances of this anecdote. All the street lights in Edmonton were replaced a few years ago because the ones installed during the 1990s have rusted and toppled over. The city wasn't careful enough about checking the credentials of the company that installed them and ended up paying a premium price for a very cheap alloy. The new lights have a different control system, which is much more difficult to hack.

I would suggest that this particular phenomenon might be best explained by questioning the local boys about their familiarity with the lights' control system; once I figured

out how the controls worked, I must admit that I caused a few other people to think they were possessed.

David Gallinger
mild.euphoria@gmail.com

Bipolar Bamboozle Letters

I was extremely disappointed that you chose to print in the January/February 2009 issue a letter from an individual self-reporting that his symptoms of depression had not been alleviated by a VNS device. This is irrelevant to the function of the SKEPTICAL INQUIRER and analogous to touting a single, anecdotal report of a UFO as evidence for their existence. Regardless of whether the therapy can be demonstrated to be statistically effective, one individual's experience with it is meaningless.

I also immediately questioned, given that this individual thrice reiterates that he "wants it out," why he hasn't had the device removed.

F.J. Bergmann
Poynette, Wisconsin

In the January/February 2009 Letters to the Editor section, Stephen Flora replies to criticisms on his "Bipolar Bamboozle" article (SI, September/October 2008). Again, he reiterates the questionable claim that "rates of recovery of schizophrenia are eight times more likely without medication than with it," and again he cites a study of Harrow and Jobe (2007) to support that claim. What he probably means is that *recovery* is more likely, or, equivalently, that the *rates of recovery* are *higher* without medication. Putting bad grammar aside, such a bold claim can only be made when it is supported by a randomized clinical trial. The study by Harrow and Jobe is not randomized. It does come to the conclusion that of the patients who recovered, there were significantly more patients not on medication than on medication. So what? It is—almost trivially—true that people not on medication tend to be healthier than people on medication. This can hardly be a reason for taking sick people off medication.

The authors of the paper are all too aware of this, and they say explicitly: "Some of the differences could be because of the patients with major symptoms being more likely to be placed on antipsychotic medications, and as a result, in naturalistic samples, patients on these medications are more likely to be more symptomatic and functioning poorly."

Do the authors share Flora's opinion that antipsychotics do more harm than good? They are also very explicit on that: "In general, modern-day medications for the severely mentally ill are a positive factor for many of these patients, especially those who remain in clinical outpatient settings; this has been firmly established in a large number of efficacy and effectiveness studies with first-generation antipsychotics and, more recently, second-generation antipsychotics, with the studies involving patients in clinical settings."

I find it hard to believe that Stephen Flora did not understand the results of this study. Please report these corrections in your next issue of SI, lest there be schizophrenia patients discontinuing their medications as a result of that article.

John Vos
Leuven, Belgium

I always enjoy the magazine and frequently turn first to the Letters section to see what others thought about the articles. My concern is with some of the comments made in the "Bipolar Bamboozle" letters (January/February 2009).

More than two hundred years ago some rabble rousers got together and decided to change the way things were. They were successful and so sat down to draw up a blueprint for their new endeavor. It was a pretty good document—not at all scientific, even allowing that there was a God—but they quickly realized that certain items had been left out. Ten amendments were drafted and eventually voted upon and accepted. The first of these amendments deals with speech. That's right, I am talking about the United States Constitution and the Bill of Rights.

We may all wish we could prevent someone from saying something, but the United States Supreme Court has made it clear that advertisements are not among the things denied freedom of speech. To me, it is not "appalling" that someone can advertise. The state of critical thinking by the viewer/reader may be appalling, but not the right to hawk ones wares. Also, it is the role of the professional to educate the patient, as these are prescription-only substances.

So, I close by saying I am appalled and saddened by the letter writer who forgets basic freedoms and responsibilities, substituting his expertise for the peoples' right to know.

Edward David, MD, JD
Deputy Chief Medical Examiner
State of Maine

Mr. Belloc and More

Regarding Martin Gardner article "Mr. Belloc Objects" (November/December 2008), I was surprised to read in the last paragraph (p. 24): "I am pleased to report that Pope John Paul declared evolution *more than a theory* and worthy to be taught in all Catholic schools."

These are Mr. Gardner's words and not the Pope's. The Pope actually said:

"New knowledge has led to the recognition of the theory of evolution as *more than a hypothesis*" (address of Pope John Paul II to the Pontifical Academy of Sciences, October 22, 1996) with, again, my italics.

Actually, the Pope's words are correct, not Gardner's. As you can see, Gardner fell into the trap of using the word "theory" from the point of view of the layman. We know that in science, when you have overwhelming evidence you have a theory, you don't have "more than a theory."

Carlos A. Altgelt
Martínez, Argentina

I was delighted to read Martin Garder's article on the friction between H.G. Wells and Hilaire Belloc over Wells's *Outline of History*. It may be of interest to your readers that Project Gutenberg Australia (at http://gutenberg.net.au/) offers a free download of Belloc's response. They'll also find many wondrous and unusual out of print stories by H.G. Wells and others in text format. My interest in Belloc centers on the economic philosophy of distributionism, a socialist guild system promoted by the Church. He and G.K. Chesterton, another Catholic thinker, fielded numerous articles lauding its attraction to a society already steeped in the socialism of the 1930s.

Dan Nichols
Kempner, Texas

The letters column is a forum for views on matters raised in previous issues. **Letters should be no longer than 225 words.** Due to the volume of letters we receive, not all can be published. Send letters as e-mail text (not as attachments) to letters@csicop.org. In the subject line, provide an informative identification, e.g.: "Letter re: Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122, or fax it to 505-828-2080.

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James E. McGaha, astronomer, USAF pilot (ret.)
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PUERTO RICO. Sociedad De Escépticos de Puerto Rico, Luis R. Ramos, President. 2505 Parque Terra Linda, Trujillo Alto, Puerto Rico 00976. Tel: 787-396-2395; e-mail: Lramos@escepticospr.com; Web site www.escepticor.com.

International groups listings have been moved to our Web site: www.csicop.org

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